

# AVEVA™ Widgets, Apps, and Controls Help

2023 R2 P01

© 2015-2023 by AVEVA Group Limited or its subsidiaries. All rights reserved.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, mechanical, photocopying, recording, or otherwise, without the prior written permission of AVEVA Group Limited. No liability is assumed with respect to the use of the information contained herein.

Although precaution has been taken in the preparation of this documentation, AVEVA assumes no responsibility for errors or omissions. The information in this documentation is subject to change without notice and does not represent a commitment on the part of AVEVA. The software described in this documentation is furnished under a license agreement. This software may be used or copied only in accordance with the terms of such license agreement. AVEVA, the AVEVA logo and logotype, OSIsoft, the OSIsoft logo and logotype, ArchestrA, Avantis, Citect, DYNSIM, eDNA, EYESIM, InBatch, InduSoft, InStep, IntelaTrac, InTouch, Managed PI, OASyS, OSIsoft Advanced Services, OSIsoft Cloud Services, OSIsoft Connected Services, OSIsoft EDS, PIPEPHASE, PI ACE, PI Advanced Computing Engine, PI AF SDK, PI API, PI Asset Framework, PI Audit Viewer, PI Builder, PI Cloud Connect, PI Connectors, PI Data Archive, PI DataLink, PI DataLink Server, PI Developers Club, PI Integrator for Business Analytics, PI Interfaces, PI JDBC Driver, PI Manual Logger, PI Notifications, PI ODBC Driver, PI OLEDB Enterprise, PI OLEDB Provider, PI OPC DA Server, PI OPC HDA Server, PI ProcessBook, PI SDK, PI Server, PI Square, PI System, PI System Access, PI Vision, PI Visualization Suite, PI Web API, PI WebParts, PI Web Services, PRiSM, PRO/II, PROVISION, ROMeo, RLINK, RtReports, SIM4ME, SimCentral, SimSci, Skelta, SmartGlance, Spiral Software, WindowMaker, WindowViewer, and Wonderware are trademarks of AVEVA and/or its subsidiaries. All other brands may be trademarks of their respective owners.

U.S. GOVERNMENT RIGHTS

Use, duplication or disclosure by the U.S. Government is subject to restrictions set forth in the license agreement with AVEVA Group Limited or its subsidiaries and as provided in DFARS 227.7202, DFARS 252.227-7013, FAR 12-212, FAR 52.227-19, or their successors, as applicable.

Publication date: Wednesday, December 6, 2023

Publication ID: 1008671

## Contact information

AVEVA Group Limited
High Cross
Madingley Road
Cambridge
CB3 0HB. UK

https://sw.aveva.com/

For information on how to contact sales and customer training, see https://sw.aveva.com/contact.

For information on how to contact technical support, see https://sw.aveva.com/support.

To access the AVEVA Knowledge and Support center, visit https://softwaresupport.aveva.com.

# Contents


**AVEVA Industrial Widgets. . . . . 14**

**Configure Widget Properties. . . . . 14**

**Widget Properties. . . . . 16**

Carousel Widget. . . . . 16

DataGrid Widget. . . . . 16

Configure the Data Grid Widget. . . . . 21

Map_App Widget. . . . . 24

QRCode_Scanner Widget. . . . . 26

Teamwork Widget. . . . . 27

Web_Browser Widget. . . . . 28

**AVEVA OMI Apps. . . . . 29**

**Alarm App. . . . . 29**

Getting Started. . . . . 29

Configure Run-Time Properties of the Alarm App. . . . . 30

Follow Current Context Property. . . . . 38

Alarm Query Property. . . . . 39

Client Mode Property. . . . . 41

Show Grid Property. . . . . 41

Show Headers Property. . . . . 42

Show Status Bar Property. . . . . 42

Show Context Menu Property. . . . . 42

Auto Scroll Property. . . . . 43

Flash UnAck Alarms Property. . . . . 43

Requires Ack Signature Property. . . . . 43

Ack Min Priority Property. . . . . 43

Ack Max Priority Property. . . . . 44

Show Command Bar Property. . . . . 44

Set Alarm App Properties. . . . . 44

Show Current Alarms and Events. . . . . 45

Show Historical Alarms and Events. . . . . 47

Set Alarm Colors. . . . . 49

Rename, Resize, and Reorder Column Headers. . . . . 54

Sort Alarms. . . . . 56

Filter Alarms. . . . . 58

Configure Runtime Behavior. . . . . 67

Use the Alarm App at Run Time. . . . . 75


© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

Refresh the Alarm Control Grid. . . . 75
View Status Bar Information. . . . 75
Acknowledge Alarms. . . . 77
Dismissing Alarms at Run Time. . . . 80
Shelve and Unshelve Alarms at Run Time. . . . 81
Sort Alarms During Run Time. . . . 84
Filter Alarms at Run Time. . . . 85
Reset the Grid. . . . 90
Hide Alarms. . . . 90
Freeze and Unfreeze the Alarm App Grid. . . . 91
Show Alarm Statistics. . . . 92
Set Font Size for the Alarm Grid. . . . 92
AlarmApp Scripts. . . . 93
Write a Named Script for the AlarmApp. . . . 94
Write an Event Handler Script. . . . 96
**ContentPresenter App. . . . 101**
ContentPresenter App Run Time Examples. . . . 105
Configure the ContentPresenter App. . . . 110
More Information About ContentPresenter App Properties. . . . 111
Contextualization. . . . 126
ContentPresenter OMI App Scripting. . . . 127
ContentPreserter App Property Validation. . . . 129
Graphic Displays During Runtime. . . . 130
Upgrade and Migration of the ContentPresenter App. . . . 142
**DocViewerApp. . . . 143**
Change the Zoom Level of a Document. . . . 144
Touch Support. . . . 144
Optimize the DocViewerApp for a Touch Device. . . . 144
Compatibility of the DocViewerApp. . . . 145
Configure the DocViewerApp to Show Word Documents. . . . 146
Before You Begin. . . . 146
Create an External Content Item. . . . 147
Configure an External Content Item. . . . 148
Link an External Content Item to an Object or Template. . . . 149
Associate an External Content Item to a ViewApp. . . . 150
Details of the External Content Editor. . . . 152
More Information About Media Types. . . . 154
More Information About Specifying a URI. . . . 155
**AVEVA Graphic Repeater OMI App. . . . 156**
Configure the Graphic Repeater App. . . . 161
Example of Building the Graphic Repeater App. . . . 161
Configure Graphic Repeater App Properties. . . . 165
Upgrade and Migration of the Graphic Repeater App. . . . 179
**HamburgerApp. . . . 179**
Configure the HamburgerApp. . . . 180
**AVEVA Historian Client Trend. . . . 181**
HistoricalTrendApp Properties. . . . 182

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

Configure HistoricalTrendApp Properties. . . . 183
Configure a Trend. . . . 188
Creating a New Server Connection. . . . 189
Add a Source Tag to a Trend. . . . 190
Tag Picker. . . . 191
Time Picker. . . . 195
Configuring Trend Application Options. . . . 196
Configuring Trend File Properties. . . . 202
Configuring a Trend to Use a Summary Tag. . . . 208
Using Absolute or Relative Times. . . . 209
Using Absolute Time. . . . 209
Using Relative Time. . . . 210
Switching Between Absolute and Relative Time: Example. . . . 211
Using Time Offsets to Compare Data in Absolute Time. . . . 212
Working with Replicated Tags. . . . 215
Adding a Source Tag or Replicated Tag. . . . 216
Finding a Source Tag or Replicated Tag. . . . 216
Replacing a Source Tag or Replicated Tag. . . . 217
Work with Run Time Trend Charts. . . . 218
Viewing Data in the Trend Chart. . . . 218
Viewing Tag Definition Information. . . . 243
Viewing Trend Data in a Table Format. . . . 244
Working with Scatter Plots. . . . 248
Using Annotations. . . . 256
Working with Trend Files. . . . 261
Outputting Trend Data. . . . 263
Historical Trend Pen Scripts. . . . 265
Write a HistoricalTrendApp Named Script. . . . 266
Write an Event Handler Script. . . . 267
Data Retrieval Options. . . . 272
Understanding Retrieval Modes. . . . 272
Understanding Retrieval Options. . . . 308
Retrieval Styles for Trend. . . . 343
**ImageViewerApp. . . . 350**
Change the Orientation of an Image. . . . 351
Change the Size of an Image. . . . 352
Scroll an Image. . . . 352
Touch Support. . . . 353
Optimize the ImageViewerApp for a Touch Device. . . . 353
Compatibility of the ImageViewerApp. . . . 353
Configure the ImageViewerApp. . . . 354
Before You Begin. . . . 354
Create an External Content Item. . . . 355
Configure an External Content Item. . . . 356
Link an External Content Item to an Object or Template. . . . 357
Associate an External Content Item to a ViewApp. . . . 358
Details of the External Content Editor. . . . 360
More Information About Media Types. . . . 362

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

More Information About Specifying a URI. . . . 363
**InSightApp. . . . 363**
Steps to Configure the InSightApp. . . . 364
InsightApp Security Requirements. . . . 367
Favor trusted connections. . . . 368
Require trusted connections. . . . 368
Using a Self-Signed Certificate. . . . 369
**MapApp. . . . 369**
Configure the Map App Global Settings. . . . 370
Before Configuring a Map App. . . . 371
Create User Credentials. . . . 371
Set Up a Map Server. . . . 372
Configure Map Sources. . . . 376
Configure the Map Control. . . . 383
Graphic Limitations of Graphics in a Map App. . . . 387
Properties Supported by All Graphic Elements With Some Limitations. . . . 388
Supported Graphic Elements and Additional Properties. . . . 388
Supported Animations. . . . 391
Major Unsupported Industrial Graphic Features. . . . 393
Map App Enhancements. . . . 394
Export and Import Map Source Data. . . . 396
**AVEVA™ OMI App for Microsoft Power BI - Flex License Only. . . . 398**
How to Download and Install the Microsoft Power BI App. . . . 399
Configure the Power BI App. . . . 400
Create a Named Credential for a Power BI Report. . . . 400
Configure Power BI App Properties. . . . 401
Power BI App Properties. . . . 402
Power BI App Scripting. . . . 407
Power BI Basic Filter Scripts. . . . 408
Power BI Advanced Filter Scripts. . . . 410
Power BI Relative Date Filter Scripts. . . . 412
Power BI Relative Time Filter Scripts . . . . 415
Report Filtering Scripting Operations. . . . 418
Power BI App Script Example. . . . 419
Join the Microsoft 365 Developer Program. . . . 421
Create and Publish a Power BI Report. . . . 427
Power BI App Connectivity Behavior. . . . 435
**NavigationApps. . . . 435**
NavigationTree. . . . 435
Configure a NavigationTree Control. . . . 436
Configure the Breadcrumb Control. . . . 439
Configure the NavBreadcrumbControl. . . . 440
**Insight Newsfeed OMI App. . . . 442**
View Different Levels of News Feed Detail. . . . 442
Summary View. . . . 442
List View. . . . 443
Graph View. . . . 444

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

Newsfeed App Chart View. . . . 445
**Configure the Newsfeed App. . . . 447**
Prerequisites . . . . 447
Insight Requirements. . . . 447
System Platform Requirements. . . . 447
Security Requirements. . . . 448
Import the Newsfeed App. . . . 450
Configure the Newsfeed App. . . . 451
Change the Password of the Insight Data Cache. . . . 454
Deploy and Run the ViewApp. . . . 455
**Using the Newsfeed App During Runtime. . . . 457**
Select Data to Appear in the Newsfeed App. . . . 457
Format Data Shown by the Newsfeed App. . . . 460
**PDFViewerApp. . . . 462**
Change the View of a PDF Document. . . . 463
Search Within a PDF Document. . . . 463
Navigate Within a PDF Document. . . . 464
Change the Orientation of a PDF Document. . . . 465
Copy and Paste Content From a PDF Document. . . . 466
Change the Page View of a PDF Document. . . . 467
Touch Support. . . . 468
Optimize the PDFViewerApp for a Touch Device. . . . 469
Configure the PDFViewerApp. . . . 470
Before You Begin. . . . 470
Create an External Content Item. . . . 471
Configure the External Content Item for a PDF Document. . . . 472
Link an External Content Item to an Object or Template. . . . 473
Associate an External Content Item to a ViewApp. . . . 474
Details of the External Content Editor. . . . 476
More Information About Media Types. . . . 478
More Information About Specifying a URI. . . . 479
**AVEVA PLC Viewer OMI App Introduction. . . . 480**
PLC Viewer App Requirements. . . . 481
PLC Viewer App Configuration. . . . 483
Required and Optional Information. . . . 483
Configure PLC Data Sources. . . . 483
Configure PLC Viewer App Control Properties. . . . 489
PLC Viewer App Runtime Version Check. . . . 491
PLC Viewer App During Runtime. . . . 492
Runtime Enhancements of the PLC Viewer App. . . . 493
See More Information From the PLC Viewer App. . . . 493
Set View Context. . . . 494
Navigation from a ViewApp. . . . 495
**AVEVA™ PI Vision OMI App - Flex License Only. . . . 498**
AVEVA PI Vision OMI App Requirements. . . . 498
How to Download and Install the PI Vision App. . . . 499
SSL Certificate for Run-Time Nodes. . . . 500

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

Export the PI Vision SSL Digital Certificate . . . 501
Install the Exported SSL Digital Certificate . . . 501
Configure the AVEVA PI Vision OMI App . . . 502
Configure PI Vision Properties . . . 502
Dashboard Displays . . . 513
Ad Hoc Displays . . . 514
Freeform Displays . . . 516
Time Properties . . . 517
Contextualization . . . 517
PI Vision OMI App Scripting . . . 521
PI Vision OMI App Property Validation . . . 523
Using the PI Vision OMI App During Runtime . . . 524
Troubleshooting . . . 525
Upgrade and Migration of the PI Vision OMI App . . . 527
**Sankey Diagram App - Flex License Only . . . 528**
Downloading and Installing the Sankey Diagram App . . . 529
Changing the Sankey Diagram Display Theme . . . 530
Working with Sankey Diagrams . . . 531
Configuring Sankey Diagram OMI App . . . 533
Creating a New Chart on Sankey Diagram OMI App . . . 533
Adding Sankey Diagram OMI App to a Layout . . . 534
Adding Layout to View App . . . 535
Displaying Sankey Chart in Runtime . . . 536
**Scheduler App - Flex License Only . . . 538**
Prerequisites . . . 538
Downloading and Installing the Scheduler App . . . 538
Configuring the Scheduler Application . . . 540
Configuring the Properties . . . 540
Configuring the Scheduler Object . . . 544
Runtime Configuration . . . 546
Configuring Holiday / Weekend Schedule . . . 546
Configuring Time Period . . . 547
Configuring Subsystems . . . 547
Configuring Zones . . . 548
Configuring Schedules . . . 549
**ScreenCaptureAndPrint App - Flex License Only . . . 565**
Prerequisites . . . 565
Installing the ScreenCaptureAndPrint App . . . 565
Configuring the ScreenCaptureAndPrint Application . . . 567
Customizing the Properties . . . 567
Using the Application . . . 574
Capturing the Screen . . . 574
Saving the Captured Screenshot . . . 574
Copying to Clipboard . . . 575
Printing the Screen . . . 576
**SpreadsheetViewerApp . . . 577**
Change the Zoom Level of a Spreadsheet . . . 577
Touch Support . . . 578

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

Optimize the SpreadsheetViewerApp for a Touch Device. . . . 578
Compatibility of the SpreadsheetViewerApp. . . . 578
Configure the SpreadsheetViewerApp. . . . 579
Before You Begin. . . . 579
Create an External Content Item. . . . 580
Configure an External Content Item for the SpreadsheetViewerApp. . . . 581
Link an External Content Item to an Object or Template. . . . 582
Associate an External Content Item to a ViewApp. . . . 583
Details of the External Content Editor. . . . 585
More Information About Media Types. . . . 587
More Information About Specifying a URI. . . . 588
**TitleBarApp. . . . 588**
Configure a Title Bar. . . . 589
More Information About TitleBarApp Properties. . . . 589
**VideoViewerApp. . . . 593**
Playback Controls of the VideoViewerApp. . . . 594
Pause and Play Control. . . . 594
Playback Slider Control. . . . 594
Volume Control. . . . 594
Playback Video Size. . . . 594
Compatibility of the VideoViewerApp. . . . 596
**Configure the VideoViewerApp. . . . 597**
Before You Begin. . . . 597
VideoViewer Error Mesage. . . . 597
Create an External Content Item. . . . 598
Configure an External Content Item. . . . 599
Link an External Content Item to an Object or Template. . . . 601
Associate an External Content Item to a ViewApp. . . . 601
**WWWebAppControls. . . . 603**
Configure a Web Control. . . . 604
Using AuthenticationProviders Mode with WebAppControls . . . . 606

## Client Controls. . . . 607

**The Alarm Client Control. . . . 608**
Client Modes. . . . 608
InTouch Alarm Manager. . . . 608
Alarm and Event Storage. . . . 608
Switching Between Client Modes. . . . 609
Using the Alarm Control in Industrial Graphics. . . . 609
Alarm Acknowledgement. . . . 609
Current Value and Quality Display. . . . 610
Working With Alarm Queries and Filters. . . . 610
Alarm Queries. . . . 610
Alarm Query Syntax when Register Using Galaxy_<GalaxyName> is Enabled. . . . 611
Alarm Filtering. . . . 612
Alarm Queries to Filters Translation. . . . 612
Alarm Shelving. . . . 613

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

Shelving Alarms During Run Time. . . . 613
Unshelving Alarms During Run Time. . . . 613
Alarm Hiding. . . . 613
Alarm Control Grid Freezing. . . . 614
Alarm Sorting. . . . 614
Support for a Redundant Historian Server. . . . 614
Status Bar. . . . 615
Configure the Alarm Client Control. . . . 616
About Configuring the Alarm Control. . . . 616
Placing the Alarm Control into an Industrial Graphic. . . . 616
Setting Alarm Control Properties. . . . 617
Showing Current Alarms or Recent Alarms and Events. . . . 618
Showing Historical Alarms and/or Events. . . . 620
Set Alarm Control Colors. . . . 624
Rename, Resize, and Reorder Column Headers. . . . 630
Sort Alarms. . . . 633
Filter Alarms. . . . 635
Setting Time Zone and Format. . . . 640
Configuring Run-Time Behavior. . . . 644
Use the Alarm Control at Run Time. . . . 653
Refresh the Alarm Control Grid. . . . 653
View Status Bar Information. . . . 653
Acknowledge Alarms. . . . 655
Dismissing Alarms at Run Time. . . . 658
Shelve and Unshelve Alarms at Run Time. . . . 658
Filter Alarms at Run Time. . . . 662
Reset the Grid. . . . 667
Hide Alarms. . . . 668
Freeze and Unfreeze the Alarm Control Grid. . . . 669
Show Alarm Statistics. . . . 669
Switching between Client Modes. . . . 670
Switching Run-Time Languages. . . . 671
Scripting the Alarm Control. . . . 673
Alarm Control Properties. . . . 673
Alarm Control Methods. . . . 717
Configuring Events. . . . 750
.NET Colors. . . . 751
Transferring Alarm Configuration from InTouch. . . . 754
Transferring the InTouch Alarm Viewer Control Configuration. . . . 754
Transferring the InTouch Alarm DB View Control Configuration. . . . 760
Transferring Query Favorites Configuration. . . . 768
Mapping Properties and Methods. . . . 768
**The Trend Client. . . . 775**
Understanding the Trend Client. . . . 775
Differences between the Trend Client Control and the Historian Client Trend Control. . . . 775
Data Sources for the Trend Client. . . . 776
Configuring the Trend Client. . . . 777
Placing the Trend Client into an Industrial Graphic. . . . 777

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

Removing the Trend Client from an Industrial Graphic. . . . 777
Validating the Configuration of the Trend Client. . . . 777
Clearing the Configuration from the Trend Client. . . . 778
Adding a Pen. . . . 778
Configuring Historical Sources. . . . 783
Using the Tag Picker. . . . 786
Using the Filter Pane. . . . 789
Using the Tags Pane. . . . 790
Configuring the Trend Appearance. . . . 790
Setting Chart Options. . . . 792
Setting Data Bindings. . . . 793
Handling Trend Events. . . . 794
Scripting the Trend Client. . . . 796
Trend Client Properties. . . . 796
Trend Client History Sources. . . . 818
Trend Client Methods. . . . 823
Trend Client Events. . . . 836
Colors in Trend Client. . . . 838
.NET Colors. . . . 838
Scripting Differences between Trend Client and ActiveFactory Trend Control. . . . 840
Understanding Data Retrieval. . . . 845
Understanding Retrieval Modes. . . . 845
Understanding Retrieval Modes. . . . 846
**The SQLDataGrid Graphic. . . . 849**
Securely Accessing the SQL Data Grid. . . . 849
Using the SQLDataGrid Graphic. . . . 850
Configuring Authentication Modes. . . . 851
Configuring the Database Connection. . . . 852
Configuring SQLDataGrid Graphic Custom Properties. . . . 852
Using Scripts with the SQLDataGrid. . . . 854
Associating Grid Control Actions to InTouch Scripts and Animations. . . . 854
Accessing Data from a Selected Row in the SQLDataGrid. . . . 855
Working with the SQLDataGrid in Run Time. . . . 856
About Working with the SQLDataGrid in Run Time. . . . 856
Viewing Data. . . . 857
Discarding Changes. . . . 863
Viewing Errors. . . . 863
Writing Changes to the Database. . . . 864
Database Connection Management. . . . 866
Custom Properties for the SQLDataGrid Graphic. . . . 867

## Web Client. . . . 875

**Using the InTouch Web Client. . . . 876**
About the InTouch Web Client. . . . 876
Securing InTouch Web Client Access. . . . 876
Accessing InTouch Web Client from Outside the OT Network. . . . 878
Registering with the AVEVA Identity Manager. . . . 878
Accessing the InTouch Web Client Using Single Sign On. . . . 879

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

Using Local Tags with AIM. . . . 880
InTouch Web Client in Operations Control connected experience. . . . 880
Configuring User Access in InTouch Web Client. . . . 887
Enabling the InTouch Web Client Feature. . . . 888
Customizing the InTouch Web Client. . . . 888
Viewing Applications in a Web Browser. . . . 889
Settings Related to InTouch HMI. . . . 890
Designing an InTouch Web Client Application. . . . 890
Using Virtual Account for InTouch Web Client. . . . 891
Configuring Graphics for Viewing in InTouch Web Client. . . . 892
Setting the InTouch Web Client Home Symbol. . . . 893
Understanding the behavior of the InTouch Web Client Home Icon. . . . 893
InTouch Web Client Fast Switch. . . . 893
Understanding the InTouch Web Client Page. . . . 894
Application Graphics and Browser Resizing. . . . 896
Pan and Zoom Support. . . . 897
Generating the iFrame Code Block. . . . 898
**Supported Graphical Elements and Known Limitations. . . . 900**
Known Limitations. . . . 900
Properties Supported by All Supported Graphical Elements. . . . 901
Properties Supported by All Graphic Elements With Some Limitations. . . . 901
Supported Graphic Elements and Additional Properties. . . . 902
Supported Animations. . . . 908
**InTouch Web Client Mobile App. . . . 910**
Operating System Requirements. . . . 910
Logging in to Mobile App. . . . 910
Using the InTouch Web Client Mobile App. . . . 910
**Managing the InTouch Web Client. . . . 912**
InTouch Web Client Error Handling. . . . 912
Browser and Mobile Support. . . . 912
Troubleshooting Viewing Graphics in a Web Browser. . . . 913
Invalid Certificate Error. . . . 913
Add an Extension to the Chrome Web Browser. . . . 914
**Licensing the InTouch Web Client. . . . 916**
Licensing for InTouch Application Graphics in a Web Browser. . . . 916
Acquiring a License. . . . 916
License Features. . . . 917
Single Session Mode. . . . 919
Grace Period. . . . 919
Periodic Renewal. . . . 920
License Release. . . . 920
**Workspace. . . . 921**
Introduction. . . . 921
About Workspace. . . . 921
Prerequisites for Workspace. . . . 921
Managing the Workspace. . . . 921
Enable Workspaces. . . . 921

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

Access Workspace. . . . 921
Create New Workspace. . . . 922
Save Workspace. . . . 923
Share Workspace. . . . 923
Understanding the Workspace Page. . . . 923
Workspace Title Bar. . . . 924
Workspace View Panel. . . . 924
Working Area. . . . 925
Cards. . . . 925
Graphics Browser. . . . 926
Content Settings Panel. . . . 926
Working with Workspace. . . . 926
Add Industrial Graphics to Workspace. . . . 926
Rename Cards. . . . 927
Adjust Card Size. . . . 927
Modify Card Properties. . . . 928
Delete Cards. . . . 928
Bind Industrial Graphics Custom Properties. . . . 928

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# AVEVA Industrial Widgets

Widgets are small web components that can extend the functionality of a webpage or website. Custom-built websites can also incorporate widgets, by using open-source code or frameworks to provide certain functionality in whole or in part. A widget is a self-contained code block that slots into a website without changing any of its features. Widgets are most frequently used to provide on-screen user interface elements that ingrate with other platforms and data sources. A widget can be run on any web page on a website, with consistent placement and user interface. For example, social media, weather, RSS or podcast widgets.

Widgets are available under the Widgets folder in the Industrial Graphic Toolbox. Widgets can also be interactive or resizable. Widgets are different than apps.

For more information on incorporating Widgets in AVEVA InTouch HMI or AVEVA OMI, refer to the corresponding product help.

## Configure Widget Properties

You can configure a web widget for a web-enabled application by two methods based on the AVEVA product you are using.

- Configure a Widget for a Web-Enabled AVEVA OMI ViewApp

  Place a web-enabled widget directly on a layout pane and configure the properties in the **Properties** tab.

- Configure a Widget for Other Web-Enabled AVEVA Products

  The following list shows other AVEVA products that will be able to support web-enabled widgets by embedding them into Industrial Graphics:

  - AVEVA OMI
  - AVEVA InTouch HMI
  - AVEVA Citect SCADA
  - AVEVA Edge
  - AVEVA OASyS SCADA
  - AVEVA Insight

The following procedure describes the major steps of a workflow to embed a web-enabled widget within an Industrial Graphic.

**To embed a widget in an Industrial Graphic**

1. Open the Industrial Graphic Editor with your AVEVA product.
2. Create a new graphic and open it on the Industrial Graphic Editor canvas.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

3. Select the **Toolbox** tab and select the **Widgets** folder to show the set of widgets.

   Widget thumbnails appear near the bottom of the **Toolbox** area.
4. Drag and drop the widget you want to embed within the graphic you created.
5. With the embedded widget selected, view the **Properties** area to show the list of widget properties.
6. Configure the widget's properties and save your work.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Chapter 1 Widget Properties

The topics in this section describe the properties you can set in each of the available widgets.

## Carousel Widget

A Carousel widget shows a set of visual items within a ViewApp pane. The carousel performs like a photo carousel to show the next item in the set for a specified interval. The Carousel widget can be used to display dashboards, alerts, or alarms that are updated continuously.

**Properties**

You configure specific properties of the Carousel widget from the Layout or ViewApp editors.

| Name | Description | Default |
|---|---|---|
| **GraphicNames** | A comma separated list of graphics the carousel displays in runtime. | Empty |
| **Interval** | The display period in milliseconds the Carousel widget shows each specified graphic. | 5000 |
| **Pause** | If the Pause property is set to true, the carousel pauses the cycling of the graphics when it detects the mouse hovering or a touch down event. The carousel resumes cycling when the mouse is moved away. | True |
| **Loop** | If the Loop property is set to true, the carousel cycles through the set of graphics continuously. When Loop is set to false, the carousel stops after a single cycle. | True |
| **Autoplay** | If the Autoplay property is set to true, the Carousel widget automatically starts when the ViewApp starts running. If Autoplay is set to false, the user must select the next item to start the carousel. | True |
| **Keyboard** | If the Keyboard property is set to true, the carousel responds to keyboard inputs. | True |
| **BackgroundColor** | Sets a background color for the widget. Specify the color value in RGB, HTML Code (#FF0000) or valid HTML color name. | White |

The carousel widget is based on the Bootstrap 4.0 Carousel component, for more information on bootstrap, go here: https://getbootstrap.com/docs/4.0/components/carousel/

## DataGrid Widget

The DataGrid widget shows tabular data within a pane of a AVEVA OMI ViewApp during runtime. Data shown in the widget can be filtered by the user. The widget also includes a set of visual properties to customize the appearance of the widget and its displayed tabular data.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Dir... | \ | Date | We... | C... | Con |
|---|---|---|---|---|---|
| Exports | 2015 | 2015-01-17T18:30:00.000Z | Sunday | All | All |
| Exports | 2015 | 2015-01-18T18:30:00.000Z | Monday | All | All |
| Exports | 2015 | 2015-01-19T18:30:00.000Z | Tuesday | All | All |
| Exports | 2015 | 2015-01-20T18:30:00.000Z | Wednesday | All | All |
| Exports | 2015 | 2015-01-21T18:30:00.000Z | Thursday | All | All |
| Exports | 2015 | 2015-01-22T18:30:00.000Z | Friday | All | All |
| Exports | 2015 | 2015-01-23T18:30:00.000Z | Saturday | All | All |

## Filter Data During Runtime

Each column of data shown in the grid can be filtered. The Data Grid widget only shows the data from the row whose column item matches the filter criteria when the filter is applied.

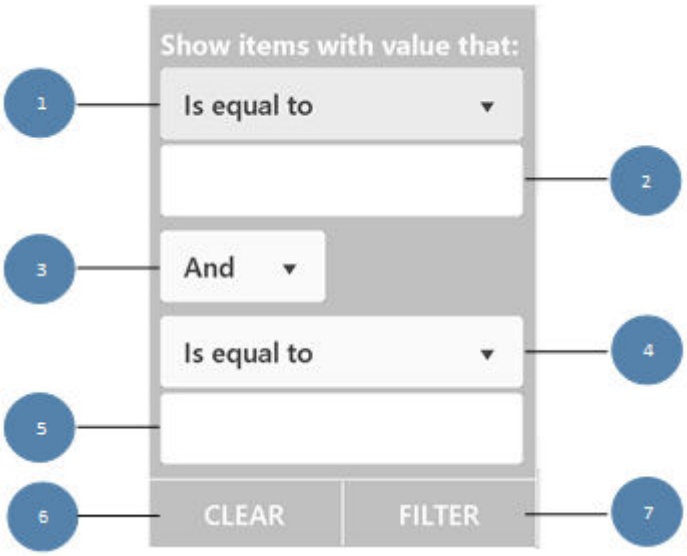
The following example shows tabular data before and after applying a filter to the **Week** column to filter the data to show only Thursday.

| Dir... | \ | Date | Week... | C... |
|---|---|---|---|---|
| Exports | 2015 | 2014-12-31T18:30:00.000Z | Thursday | All |
| Exports | 2015 | 2015-01-01T18:30:00.000Z | Friday | All |
| Exports | 2015 | 2015-01-02T18:30:00.000Z | Saturday | All |
| Exports | 2015 | 2015-01-03T18:30:00.000Z | Sunday | All |
| Exports | 2015 | 2015-01-04T18:30:00.000Z | Monday | All |
| Exports | 2015 | 2015-01-05T18:30:00.000Z | Tuesday | All |

| Dir... | \ | Date | Week... | C... |
|---|---|---|---|---|
| Exports | 2015 | 2014-12-31T18:30:00.000Z | Thursday | All |
| Exports | 2015 | 2015-01-07T18:30:00.000Z | Thursday | All |
| Exports | 2015 | 2015-01-14T18:30:00.000Z | Thursday | All |
| Exports | 2015 | 2015-01-21T18:30:00.000Z | Thursday | All |

Selecting the filter icon within each column header shows a drop-down pane to specify filter criteria.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




| | |
|---|---|
| 1 | Drop-down list of filter operators. The selected operator performs a comparison to the value entered in the paired data entry field (2). If column data matches the filter statement, the grid shows the data for that row. Unmatched data is removed and not shown in the grid.<br>The Data Grid widget supports the following filter operators:<br>• Is equal to<br>• Is not equal to<br>• Starts with<br>• Contains<br>• Does not contain<br>• Ends with<br>• Is null<br>• Is not null<br>• Is empty<br>• Is not empty<br>• Has no value<br>• Has value |
| 2 | Data entry field to type a filter value that is evaluated by the filter operator selected in (1). |
| 3 | Filters logic to evaluate filter statements 1 and 2 with Boolean operators (AND, OR). If filter statement 2 is blank, no filters logic is applied. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| 4 | Same as 1. If the paired data entry field (5) is blank, the filter operator is not evaluated. |
| 5 | Same as 2. Can be left blank. |
| 6 | Select **CLEAR** to remove filter criteria and show all data on the grid. |
| 7 | Select **FILTER** to apply the filter criteria. |

### Properties

The following table lists the properties of the DataGrid widget. All properties are exposed as dynamic runtime properties in which they can be bound to a reference to a ViewApp namespace as an:

- Attribute
- Object attribute
- MyContent attribute
- Compound expression

| Data Grid Widget Properties | Descriptions |
|---|---|
| **Type** | Gets or sets the format of source data strings.<br>• csv<br>• json |
| **AllowExport** | Allows the export of the data to a file. The default value is true. |
| **Datasource** | Gets or sets the string of JSON or CSV data shown by the Data Grid widget. |
| **ColumnDelimiter** | Gets or sets the delimiter used to separate field values in the selected grid row.<br>• Comma for csv strings<br>• Vertical pipe (\|) for json strings |
| **SelectedRow** | Gets or sets the string of the selected row field values. |
| **DateFieldFormat** | Gets or sets the date format of a date. Supports all date format strings. |
| **BackgroundColor** | Background color of the widget. |
| **ExportFileName** | If the AllowExport = True, specifies the name of the file exported. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| **FilterMode** | Gets or sets the filter mode of the grid; either default or checklist. |
| **ForeColor** | Gets or sets the text color of the widget. |
| **HeaderBackColor** | Background color of the tabular header in which column names appear. |
| **HeaderForeColor** | Text color of the header column names. |
| **SelectionBackColor** | Background color of a selected row within the grid. |
| **SelectionForeColor** | Text color of the selected row within the grid. |
| **RowHoverBackColor** | Background color of the row within the grid in which the mouse is hovering over. |
| **RowHoverForeColor** | Text color of the row within the grid in which the mouse is hovering over. |
| **Font Family** | Name of the font family used by the widget to show text. |
| **FontSize** | Gets or sets the font size in pixels of text shown in the Data Grid widget. |
| **PageSize** | Gets or sets the number of records to display at a time. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Configure the Data Grid Widget

Preparing the Data Grid widget to run in an AVEVA OMI ViewApp includes several configuration workflows.

- Assign values to Data Grid widget properties
- Prepare source data to be shown in the Data Grid widget.

The following sections of this chapter describe each configuration workflow.

## Configure Data Grid Widget Properties

Data Grid widget properties can be shown in the Layout or ViewApp editors by placing the widget on a layout pane. After selecting the widget on a pane, its properties appear on the **Properties** page and can be assigned values.

### To configure Data Grid Widget properties

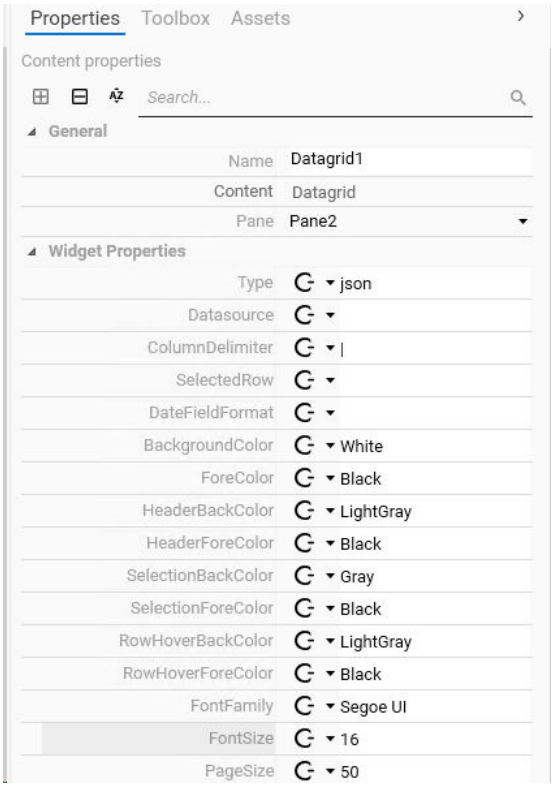
1. Open the Layout or ViewApp Editor and show the items listed in the System Platform IDE **Toolbox** tab.
2. Open the folder in the **Toolbox** where the Data Grid Widget was placed when it was imported.

   By default, the Data Grid widget is placed in the **Widgets** folder.
3. Select the Data Grid Widget thumbnail.
4. Drag and drop the Data Grid Widget thumbnail onto a layout pane.
5. Select the Data Grid Widget thumbnail on the pane and select the **Properties** tab.

   The **Properties** tab shows the properties of the Data Grid widget. The following screen capture shows the default values assigned to the widget.

   For more information about Data Grid widget properties, see Data Grid Properties.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




6. Assign values to properties and save your changes.

### Data Grid Properties

The following table lists the properties of the Data Grid widget. All properties are exposed as dynamic runtime properties in which they can be bound to a reference to a ViewApp namespace as an:

- Attribute
- Object attribute
- MyContent attribute
- Compound expression

| Data Grid Widget Properties | Descriptions |
|---|---|
| **Type** | Gets or sets the format of source data strings.<br>• csv<br>• json |
| **Datasource** | Gets or sets the string of JSON or CSV data shown by the Data Grid widget. |
| **ColumnDelimiter** | Gets or sets the delimiter used to separate field values in the selected grid row.<br>• Comma for csv strings |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| | • Vertical pipe (\|) for json strings |
| **SelectedRow** | Gets or sets the string of the selected row field values. |
| **DateFieldFormat** | Gets or sets the date format of a date. Supports all date format strings. |
| **BackgroundColor** | Background color of the widget. |
| **ForeColor** | Text color of the widget. |
| **HeaderBackColor** | Background color of the tabular header in which column names appear. |
| **HeaderForeColor** | Text color of the header column names. |
| **SelectionBackColor** | Background color of a selected row within the grid. |
| **SelectionForeColor** | Text color of the selected row within the grid. |
| **RowHoverBackColor** | Background color of the row within the grid in which the mouse is hovering over. |
| **RowHoverForeColor** | Text color of the row within the grid in which the mouse is hovering over. |
| **Font Family** | Name of the font family used by the Data Grid widget to show text.t |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| **FontSize** | Font size in pixels of text shown in the Data Grid widget. |
| **Pagesize** | Number of grid rows shown the widget display. |

### Prepare Source Data for the Data Grid Widget

Source data displayed by the Data Grid widget can be formatted as CSV or JSON strings.

For source data formatted as a CSV string, the first line is considered as the header (column names). Subsequent lines are data. Generally for CSV formatted files, a comma is used as the separator between data elements in a row.

```
Direction,Year,Date,Weekday,Country,Commodity,Transport_Mode,Measure,Value,Cumulative
Exports,2015,01/01/2015,Thursday,All,All,All,$,104000000,104000000
Exports,2015,02/01/2015,Friday,All,All,All,$,96000000,200000000
Exports,2015,03/01/2015,Saturday,All,All,All,$,61000000,262000000
Exports,2015,04/01/2015,Sunday,All,All,All,$,74000000,336000000
```

For source data formatted as a JSON string,the data is parsed as an array of dictionary objects. The first item in the array is considered as the header (column names) of the Data Grid widget.

As part of parsing the data, the data type of the fields is also resolved. The resolved data types can be any of the following:

- String
- Number
- Date

  The parser identifies a string as a Date only if the value is either in the ISO Date (e.g. 2021-08-26T07:44:36.079Z) or in the format specified by the **DateFieldFormat** property of the widget.

## Map_App Widget

AVEVA OMI and InTouch HMI include a Map_App widget to show a map containing graphics within a running application. During run time, the map provides controls and touch support to enable users to pan to different areas of the map and zoom in or out to show more or less map detail. Graphics placed in a map typically represent business assets located within an area shown by the map. These graphics can include alarming to show the current state of processes at each business location.

### Properties

For AVEVA OMI, you configure specific properties of the Map_App widget from the Layout or ViewApp editors. For InTouch HMI, you configure specific properties of the Map_App widget from the Industrial Graphic editor.

| Property | Description |
|---|---|
| **ConfigName** | Name of the Map_App widget global configuration file. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| **InitialLatitude** | Latitude of the initial center point map position in decimal degrees. Valid latitude values are +/- 0-90. |
| **InitialLongitude** | Longitude of the initial center point map position in decimal degrees.Valid longitude values are +/- 0-180. |
| **InitialZoom** | Zoom level percentage of a map when initially displayed during run time. |
| **MinZoom** | The minimum zoom percentage in which the map can be zoomed out (0-100%) during run time. |
| **MaxZoom** | The maximum zoom percentage in which the map can be zoomed in (0-100%) during run time. |
| **MaxBoundsSouth** | Latitude of the southern map boundary in decimal degrees (+/- 0-90) to constrain the vertical panning movement of the screen viewport midpoint to the bottom boundary of a map. |
| **MaxBoundsWest** | Longitude of the western map boundary in decimal degrees (+/- 0-180) to constrain the horizontal panning movement of the screen viewport midpoint to the left boundary of a map. |
| **MaxBoundsNorth** | Latitude of the northern map boundary in decimal degrees (+/- 0-90) to constrain the vertical panning movement of the screen viewport midpoint to the top boundary of a map. |
| **MaxBoundsEast** | Longitude of the eastern map boundary in decimal degrees (+/- 0-180) to constrain the horizontal panning movement of the screen viewport midpoint to the right boundary of a map. |
| **Asset** | Name of an asset selected from a displayed map. |
| **CurrentLatitude** | Current latitude of a selected item shown on a map. |
| **CurrentLongitude** | Current longitude of a selected item shown on a map. |
| **CurrentZoom** | Current zoom level of a displayed map. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| **FollowCurrentAsset** | Set this property to true to enable the MapApp widget to follow the currently selected asset (context) and automatically pan and zoom the map to display the asset's location and associated graphic (the asset should be added into the location tab in map app editor page and asset level should be as "-1").<br>Centers the map to a selected asset when the map is opened. You can use the assets to navigate within a ViewApp. For instance, you can display all the states and show a marker for each one of them. Then, by selecting a state, from a map, you can set the focus of the ViewApp to a separate pane that shows details about the state.<br>The map will zoom to the selected asset's zoom layer plus 1 percent.<br>If no asset is selected or a selected asset is not located on a map, the map shows the initial zoom layer and map center point.<br>If the **Asset** property is configured, set the **FollowCurrentAsset** property to false to enable the map to follow the asset configured to load map using the asset's location and associated graphic. |
| **Sources** | Map data sources configured in the app's map settings. (All) is the default value, which includes all map data sources specified for the Map app.<br>**Note**: All must be placed within parentheses (All) as a **Sources** property value.<br>If you want to restrict a Map app to show data from only some map sources, use a comma delimited string to specify multiple sources.<br>OSM,Bing,TemperatureOverlay |
| **ZoomLayers** | Map zoom layers configured for the Map app. (All) is the default value, which includes all zoom layers specified for the Map app.<br>**Note**: All must be placed within parentheses (All) as a **ZoomLayers** property value.<br>If you want to restrict a Map app to show data from only some zoom layers, use a comma delimited string to specify the zoom layers by name.<br>country,state,city |

## QRCode_Scanner Widget

The QRCode_Scanner widget connects to a camera to scan for a QR code and returns the resulting string.

### Properties

The following table shows a list of properties for the QRCode_Scanner widget.

| Property Name | Description | Default Value |
|---|---|---|
| **QRCode** | The resulting string of the scanned QR code. The default value is empty. | Empty |

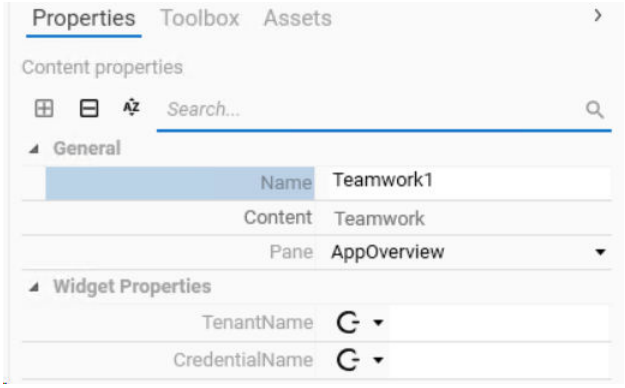
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | | |
|---|---|---|
| **AutoStart** | If set to true, the camera starts automatically after detecting a QR code. | True |
| **AutoStop** | If set to true, the camera stops after scanning a QR Code. | True |
| **StartStop** | If set to true, the camera starts scanning. If set to false, the camera stops scanning. | False |
| **BackgroundColor** | Sets the background color of the widget within a layout pane. Specify the color value in RGB, HTML Code (#FF0000) or a valid HTML color name. | Black |
| **DefaultCamera** | Sets the default camera on the connected device. True selects the front camera; false selects the back camera. | False |

## Teamwork Widget

The Teamwork widget includes two properties:

- **TenantName (Required)** needs to be set to your assigned tenant name.
- **CredentialName (Optional)** needs to be set to a user credential name or left blank.




| Properties | Descriptions | Data Type | Default Value |
|---|---|---|---|
| **TenantName** | Name of a tenant to show a specific Teamwork page during runtime. A tenant name is unique for each tenant.<br>Consult with your administrator to obtain your tenant name. | String constant or reference | <Empty string> |
| **CredentialName (Optional)** | The **CredentialName** property is not currently supported. To automatically log on to Teamwork, users should use the SSO method. | String constant or reference | <Empty string> |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Web_Browser Widget

AVEVA OMI includes a full-featured standards-compliant web browser widget. The web browser is based on Chromium Embedded Framework (CEF), the open source version of Google Chrome.

### Properties

The following table shows a list of properties for the Web_Browser widget.

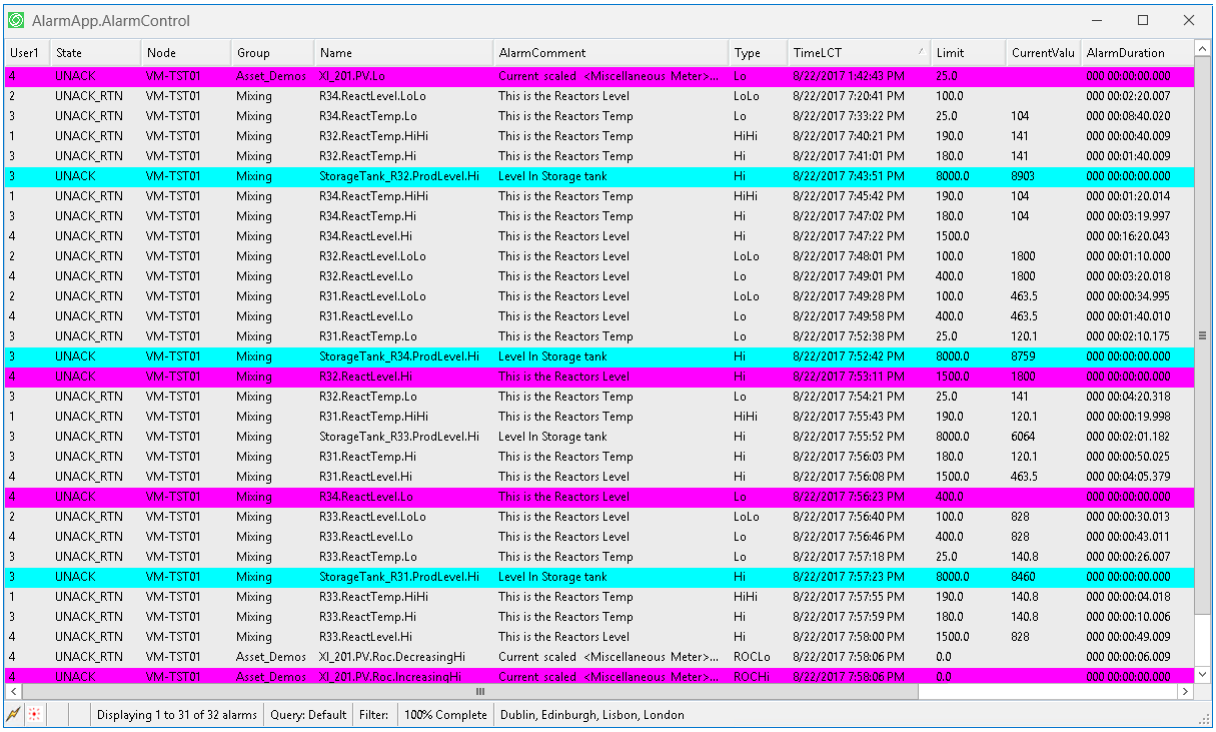
| Properties | Descriptions |
|---|---|
| **URL** | URL of the web site to be shown by the Web_Browser widget. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# AVEVA OMI Apps

## Alarm App

The Alarm app can be placed in a ViewApp to show current and historical alarms and events. Alarms or events appear in tabular form with each row representing a single alarm or event. Background color of a row indicates the severity and current state of an alarm.




| User1 | State | Node | Group | Name | AlarmComment | Type | TimeLCT | Limit | CurrentValu | AlarmDuration |
|---|---|---|---|---|---|---|---|---|---|---|
| 4 | UNACK | VM-TST01 | Asset_Demos | XI_201.PV.Lo | Current scaled <Miscellaneous Meter>... | Lo | 8/22/2017 1:42:43 PM | 25.0 | | 000 00:00:00.000 |
| 2 | UNACK_RTN | VM-TST01 | Mixing | R34.ReactLevel.LoLo | This is the Reactors Level | LoLo | 8/22/2017 7:20:41 PM | 100.0 | | 000 00:02:20.007 |
| 3 | UNACK_RTN | VM-TST01 | Mixing | R34.ReactTemp.Lo | This is the Reactors Temp | Lo | 8/22/2017 7:33:22 PM | 25.0 | 104 | 000 00:08:40.020 |
| 1 | UNACK_RTN | VM-TST01 | Mixing | R32.ReactTemp.HiHi | This is the Reactors Temp | HiHi | 8/22/2017 7:40:21 PM | 190.0 | 141 | 000 00:00:40.009 |
| 3 | UNACK_RTN | VM-TST01 | Mixing | R32.ReactTemp.Hi | This is the Reactors Temp | Hi | 8/22/2017 7:41:01 PM | 180.0 | 141 | 000 00:01:40.009 |
| 3 | UNACK | VM-TST01 | Mixing | StorageTank_R32.ProdLevel.Hi | Level In Storage tank | Hi | 8/22/2017 7:43:51 PM | 8000.0 | 8903 | 000 00:00:00.000 |
| 1 | UNACK_RTN | VM-TST01 | Mixing | R34.ReactTemp.HiHi | This is the Reactors Temp | HiHi | 8/22/2017 7:45:42 PM | 190.0 | 104 | 000 00:01:20.014 |
| 3 | UNACK_RTN | VM-TST01 | Mixing | R34.ReactTemp.Hi | This is the Reactors Temp | Hi | 8/22/2017 7:47:02 PM | 180.0 | 104 | 000 00:03:19.997 |
| 4 | UNACK_RTN | VM-TST01 | Mixing | R34.ReactLevel.Hi | This is the Reactors Level | Hi | 8/22/2017 7:47:22 PM | 1500.0 | | 000 00:16:20.043 |
| 2 | UNACK_RTN | VM-TST01 | Mixing | R32.ReactLevel.LoLo | This is the Reactors Level | LoLo | 8/22/2017 7:48:01 PM | 100.0 | 1800 | 000 00:01:10.000 |
| 4 | UNACK_RTN | VM-TST01 | Mixing | R32.ReactLevel.Lo | This is the Reactors Level | Lo | 8/22/2017 7:49:01 PM | 400.0 | 1800 | 000 00:03:20.018 |
| 2 | UNACK_RTN | VM-TST01 | Mixing | R31.ReactLevel.LoLo | This is the Reactors Level | LoLo | 8/22/2017 7:49:28 PM | 100.0 | 463.5 | 000 00:00:34.995 |
| 4 | UNACK_RTN | VM-TST01 | Mixing | R31.ReactLevel.Lo | This is the Reactors Level | Lo | 8/22/2017 7:49:58 PM | 400.0 | 463.5 | 000 00:01:40.010 |
| 3 | UNACK_RTN | VM-TST01 | Mixing | R31.ReactTemp.Lo | This is the Reactors Temp | Lo | 8/22/2017 7:52:38 PM | 25.0 | 120.1 | 000 00:02:10.175 |
| 3 | UNACK | VM-TST01 | Mixing | StorageTank_R34.ProdLevel.Hi | Level In Storage tank | Hi | 8/22/2017 7:52:42 PM | 8000.0 | 8759 | 000 00:00:00.000 |
| 4 | UNACK | VM-TST01 | Mixing | R32.ReactLevel.Hi | This is the Reactors Level | Hi | 8/22/2017 7:53:11 PM | 1500.0 | 1800 | 000 00:00:00.000 |
| 3 | UNACK_RTN | VM-TST01 | Mixing | R32.ReactTemp.Lo | This is the Reactors Temp | Lo | 8/22/2017 7:54:21 PM | 25.0 | 141 | 000 00:04:20.318 |
| 1 | UNACK_RTN | VM-TST01 | Mixing | R31.ReactTemp.HiHi | This is the Reactors Temp | HiHi | 8/22/2017 7:55:43 PM | 190.0 | 120.1 | 000 00:00:19.998 |
| 3 | UNACK_RTN | VM-TST01 | Mixing | StorageTank_R33.ProdLevel.Hi | Level In Storage tank | Hi | 8/22/2017 7:55:52 PM | 8000.0 | 6064 | 000 00:02:01.182 |
| 3 | UNACK_RTN | VM-TST01 | Mixing | R31.ReactTemp.Hi | This is the Reactors Temp | Hi | 8/22/2017 7:56:03 PM | 180.0 | 120.1 | 000 00:00:50.025 |
| 4 | UNACK_RTN | VM-TST01 | Mixing | R31.ReactLevel.Hi | This is the Reactors Level | Hi | 8/22/2017 7:56:08 PM | 1500.0 | 463.5 | 000 00:04:05.379 |
| 4 | UNACK | VM-TST01 | Mixing | R34.ReactLevel.Lo | This is the Reactors Level | Lo | 8/22/2017 7:56:23 PM | 400.0 | | 000 00:00:00.000 |
| 2 | UNACK_RTN | VM-TST01 | Mixing | R33.ReactLevel.LoLo | This is the Reactors Level | LoLo | 8/22/2017 7:56:40 PM | 100.0 | 828 | 000 00:00:30.013 |
| 4 | UNACK_RTN | VM-TST01 | Mixing | R33.ReactLevel.Lo | This is the Reactors Level | Lo | 8/22/2017 7:56:46 PM | 400.0 | 828 | 000 00:00:43.011 |
| 3 | UNACK_RTN | VM-TST01 | Mixing | R33.ReactTemp.Lo | This is the Reactors Temp | Lo | 8/22/2017 7:57:18 PM | 25.0 | 140.8 | 000 00:00:26.007 |
| 3 | UNACK | VM-TST01 | Mixing | StorageTank_R31.ProdLevel.Hi | Level In Storage tank | Hi | 8/22/2017 7:57:23 PM | 8000.0 | 8460 | 000 00:00:00.000 |
| 1 | UNACK_RTN | VM-TST01 | Mixing | R33.ReactTemp.HiHi | This is the Reactors Temp | HiHi | 8/22/2017 7:57:55 PM | 190.0 | 140.8 | 000 00:00:04.018 |
| 3 | UNACK_RTN | VM-TST01 | Mixing | R33.ReactTemp.Hi | This is the Reactors Temp | Hi | 8/22/2017 7:57:59 PM | 180.0 | 140.8 | 000 00:00:10.006 |
| 4 | UNACK_RTN | VM-TST01 | Mixing | R33.ReactLevel.Hi | This is the Reactors Level | Hi | 8/22/2017 7:58:00 PM | 1500.0 | 828 | 000 00:00:49.009 |
| 4 | UNACK_RTN | VM-TST01 | Asset_Demos | XI_201.PV.Roc.DecreasingHi | Current scaled <Miscellaneous Meter>... | ROCLo | 8/22/2017 7:58:06 PM | 0.0 | | 000 00:00:06.009 |
| 4 | UNACK | VM-TST01 | Asset_Demos | XI_201.PV.Roc.IncreasingHi | Current scaled <Miscellaneous Meter>... | ROCHi | 8/22/2017 7:58:06 PM | 0.0 | | 000 00:00:00.000 |

## Getting Started

The Alarm app includes two sets of properties that can be assigned values during design time.

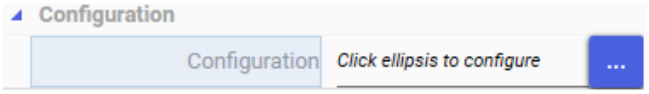
- **Runtime and context properties shown from the Properties page of the Layout and ViewApp editors**

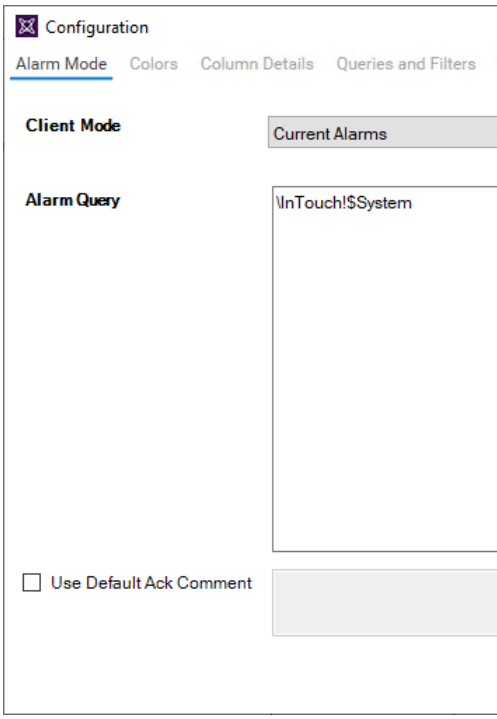
  Two sets of properties are shown on the **Properties** area of the Layout and ViewApp editors after placing an Alarm app on a layout pane. These properties are a subset of Alarm app's **Run-Time Behavior** properties. These run-time properties have been assigned default values that minimize the number of configuration tasks required to get the Alarm app running. For more information, see Configure Run-Time Properties of the Alarm App.

- **All Alarm app properties shown from the Configuration dialog box**

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

The **Properties** page includes an option to show the **Configuration** dialog. The **Configuration** dialog includes all Alarm app properties that can be assigned values. For more information about configuring an Alarm app from the **Configuration** dialog box, see Set Alarm App Properties.




Related Alarm app properties are grouped in a set of tabs shown on the **Configuration** dialog:

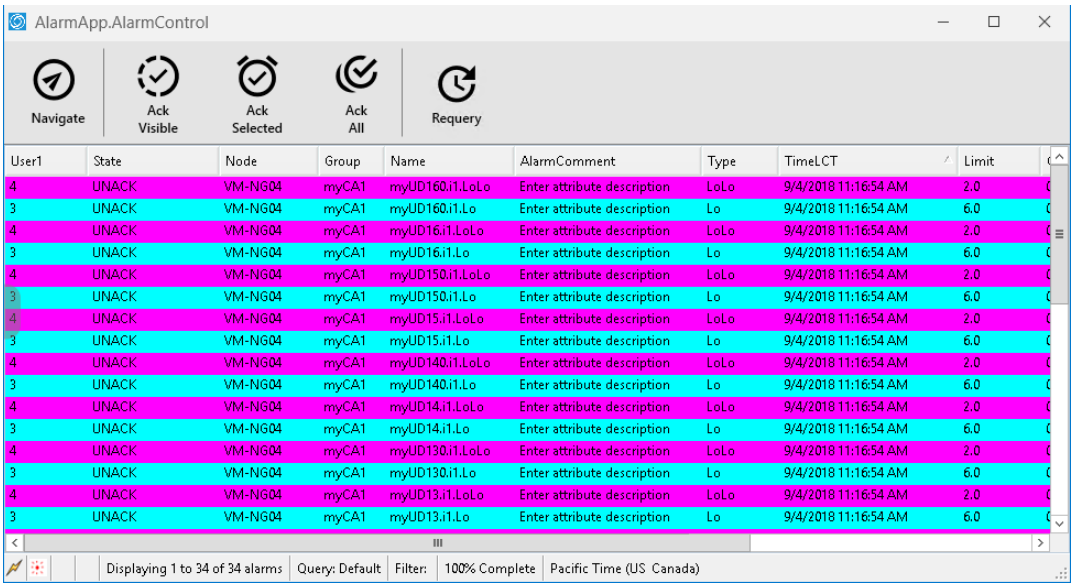
- **Alarm Mode**: Type of data shown by the Alarm app and the default alarm database query
- **Colors**: Colors shown on the alarm grid, window, heading, and alarm records.
- **Column Details**: Column order, width, and order of alarm records.
- **Queries and Filters**: Database query for alarm records and filters saved as favorites for re-use.
- **Time Settings**: Date and time format of alarm record time stamps.
- **Run-Time Behavior**: Options that determine the physical appearance of the Alarm app and options to manage alarms shown while the ViewApp is running.

## Configure Run-Time Properties of the Alarm App

The Alarm app includes a subset of run-time properties whose values determine the visual aspects or functional behavior of the Alarm app during run time. All properties are assigned default values that enable the Alarm app to run immediately in a ViewApp with minimal configuration. For more information about configuring all Alarm app properties, see Set Alarm App Properties.

The following screen shot shows the Alarm app running in a ViewApp after accepting all default values assigned to the run-time properties listed on the **Properties** page of the Layout or ViewApp editors.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




In the tabbed **Properties** area of the Layout or ViewApp editors, many Alarm app properties include a user control to assign a static or dynamic value based on the type of binding between the property and its associated reference.

| | |
|---|---|
| **Constant** | Static binding to the specified property value. |
| **In** | Dynamic property value with read only binding by the control to a reference. |
| **Out** | Dynamic property value with write only binding by the control to a reference. |
| **InOut** | Dynamic property value with read/write binding by the control to a reference. |
| **Reset** | Reset the current property to its default. |

A check box to the right of some properties indicates the initial default value of a Boolean property. When the check box is selected, the property is set to true.

The AlarmApp shows two different types of properties in the **Properties** area of the Layout editor. The **Run-Time Behavior** properties are the native properties of the AlarmApp. This topic provides descriptions of these properties. The remaining properties are from the underlying .NET alarm control that are exposed and can be edited from the Layout script editor. .NET property groups are identified by the **AlarmClientControl** prefix in their titles that appear on the **Properties** page. For example, the **AlarmClientControl.Accessibility** title appears immediately beneath the **Area Hierarchy** group of properties.

Descriptions of .NET properties, methods, and events are easily accessible from the Microsoft Web site and are not described in System Platform documentation. For more information about the .NET properties that appear in the AlarmApp, see the .NET property descriptions at the Microsoft web site. At the time of writing, they could be found at: https://docs.microsoft.com/en-us/dotnet/api/system.windows.forms.

### To configure run-time properties of the Alarm app

1. Open the Layout or ViewApp editor and show the items listed in the **Toolbox** tab.
2. Select **AlarmApp** from the **Toolbox** list to show its preview thumbnail.

   The **Toolbox** pathway to the Alarm app is:

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

_Default Content > 4. Apps > AVEVA OMI Apps > AlarmApp

3. Drag and drop the preview thumbnail on a layout pane.
4. Select the preview thumbnail on the pane and select the **Properties** grid.

   The **Properties** grid shows a list of Alarm app run-time properties. The two screen captures shown below show the complete set of Alarm app run-time properties and their assigned default values.

   The **Content** and **Pane** property fields, listed under the **General** in the **Properties** grid, show the assigned content type and the name of the pane in which the Alarm app is placed.
5. Set values for the Alarm app properties. The following tables describe Alarm app run-time properties.

**Run-Time Behavior Properties**

| | |
|---|---|
| **Follow Current Context** | Boolean value that determines if the Alarm app shows alarms from the current area selection. **Follow Current Context** is **enabled** by default. Behavior is determined by the setting of the **Only Show Alarms on Current Asset** property.<br><br>When **Follow Current Context** is **disabled,** no alarms related to the current area or asset a displayed within the Alarm app grid at run time. The **Only Show Alarms on Current Asset** property does not have any effect if **Follow Current Context** is **disabled.**<br><br>For more information about how the **Follow Current Context** property works with the **Onl Show Alarms on Current Asset** property, see Follow Current Context Property. |
| **Only Show Alarms on Current Asset** | Boolean value that determines if the Alarm app shows aggregated alarms for all assets contained in the currently-selected area, or if it shows only alarms for the currently-selecte asset.When this property is **enabled**, only alarms for the currently-selected asset are show even if the the asset is an area. Note that this property only has an effect when **Follow Current Context** is enabled.<br><br>• Default: When this property is **disabled** and **Follow Current Context** is **enabled**, alarm related to the current *area* are displayed within the Alarm app grid at run time. If the current asset is not an area, the Alarm app grid traverses up the hierarchy to aggregat alarms from the area, including other contained assets, that contains the selected asse<br>• When both this property and **Follow Current Context** are **enabled**: only alarms relate the current *asset* are displayed within the Alarm app grid at run time. Alarms for contained assets are not shown. This is the case, even if the current asset is an area.<br>• When **Follow Current Context** is **disabled**, this property has no effect. |
| **Navigate on Double Click** | Boolean value that determines if the user must double-click on an alarm to to navigate to asset that is in alarm. The default is **true**.<br><br>If set to false, navigation by selecting an alarm is disabled. See also **Show Navigate**, below, under **Command Bar**. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| **Use Description as Comment** | Boolean value that determines if an attribute description is used as the default comment f an acknowledged alarm. False is the default value to not use the description as the default comment. When this property is enabled, the comment popup window states that if left blank, the attribute description is used as the default comment:<br><br>This property is only applicable when an Ack Alarm command button is used. It has no effe when the shortcut (right-click) menu is invoked.<br><br>If the "Use Default Ack Comment" checkbox in the **Configuration** dialog is checked, no comment popup window is shown. Instead, when alarms are acknowledged, the text ente in the **Configuration** dialog is sent as the comment. |
| **Group by Header** | Boolean value that allows alarms to be grouped by column in the alarm grid when the Alar app is in historical mode. |
| **Show Grid** | Boolean value that determines if the alarm grid shows row and column lines during run tir True is the default to show grid lines. The value set to the **Show Grid** property overrides th equivalent value set from the **Configuration** dialog. |
| **Show Heading** | Boolean value that determines if each column of the alarm grid shows a heading during ru time. True is the default value to show alarm grid headers.The value assigned to the **Show Headers** property overrides the equivalent property set from the Configuration dialog. |
| **Show Status Bar** | Boolean value that determines if the status bar appears beneath the grid area of the Alarm app during run time. True is the default to show the status bar. |
| **Show Context Menu** | Boolean value that determines if a shortcut menu containing command options appears when users right-click in the alarm grid. True is the default to show a shortcut menu.<br><br>For more information, see Show Context Menu Property. |
| **Auto Scroll to New Alarms** | Boolean value that determines if the alarm grid will automatically scroll to the bottom to v new alarms. When set to **True**, the alarm grid scrolls to the newest alarm. |
| **Flash UnAck Alarms** | Boolean value that determines if unacknowledged alarms are shown in flashing text and background colors on the alarm grid during run time. True is the default to show unacknowledged alarms in flashing colors.<br><br>For an example that shows a flashing unacknowledged alarm, see Flash UnAck Alarms Property.<br><br>**Note**: **Flash UnAck Alarms** only works at run time if the **Client Mode** property is set to **Current Alarms (1)** or **Recent Alarms (2)**. The **Configuration** dialog will validate the setting and disallow enabling **Flash UnAck Alarms** if **Client Mode** is set to one of the historical mo (3, 4, or 5). The **Property** tab does not perform this validation. |
| **Requires Ack Signature** | Boolean value that determines if a signature is required to acknowledge an alarm. The def is **false** (no signature required to acknowledge an alarm).<br><br>When set to **true**, the **Requires Ack Signature** property overrides the corresponding value in the **Configuration** dialog, and the user must provide a signature to acknowledge alarms |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| **Ack Max Priority** | Numerical value (1-999) that specifies the maximum priority of an alarm that requires an acknowledgement signature.<br>**Note: Ack Max Priority** only works at run time if the **Requires Ack Signature** property is enabled. The **Configuration** dialog will validate that the property is enabled before it lets y set **Ack Max Priority**. The **Property** tab does not perform this validation. |
| **Ack Min Priority** | Numerical value (1-999) that specifies the minimum priority of an alarm that requires an acknowledgement signature.<br>**Note: Ack Min Priority** only works at run time if the **Requires Ack Signature** property is enabled. The **Configuration** dialog will validate that the property is enabled before it lets y set **Ack Min Priority**. The **Property** tab does not perform this validation. |

**Configuration Properties**

| | |
|---|---|
| **Configuration** | Selecting the ellipsis displays the **Configuration** dialog box. All Alarm app properties can be configured in the **Configuration** dialog box. However, properties that are shown in the **Properties** grid of the Layout or ViewApp editors should be configured in the tab.<br>The settings in the **Configuration** dialog box will be updated to match the settings in **Properties** grid. With some minor exceptions, changing the settings with the **Properties** gr will also update the settings in the **Configuration** dialog box.<br>For more information about assigning property values from the **Configuration** dialog box, Set Alarm App Properties. |

**Run-Time Values Properties**

| | |
|---|---|
| **Selected Row Tagname** | This is a read-only property that can be use to bind a View application namespace attribut an Application Server attribute reference to the Selected Row Tagname. This is only applicable when a user selects the row (manual selection), not when the system selects th row. The selected row tagname appears in the alarm grid at run time.<br>Although you can configure the reference as two-way (read-write), it functions as an outpu only (read-only) property at run time. |
| **Selected Row Asset** | This is a read-only property that can be used to bind a View application namespace attribu or an Application Server attribute reference to the Selected Row Asset. The selected row asset appears in the alarm grid at run time.<br>Although you can configure the reference as two-way (read-write), it functions as an outpu only (read-only) property at run time. |

**Appearance Properties**

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| **Foreground** | Foreground color of text and and command buttons that appear in the Command bar. #FF000000 is the default foreground ground, which is black.<br><br>Another foreground color can be selected by selecting the inverted triangle at the right o the **Foreground** data entry field to show a color picker.<br><br>If the Alarm app has been configured to show an area hierarchy tree view, the names of areas appear in the foreground text color. |
| **Background** | Background color of the Command bar that appears above the alarm grid. The default va is **No color**, which appears white.<br><br>Another background color can be selected by selecting the inverted triangle at the right c the **Background** data entry field to show a color picker. The default background is no colo<br><br>If the Alarm app has been configured to show an area hierarchy tree view, the backgroun color extends to the full area of the complete tree view. |

**Command Bar Properties**

| | |
|---|---|
| **Show Command Bar** | Boolean value that determines if a Command bar appears above the alarm grid area duri run time. True is the default to show a Command bar.<br><br>The Command bar displays large command buttons that are suitable for touch screen devices.<br><br>By setting the Show... properties that follow to True, the **Command Bar** can display the following command buttons:<br><br>  <br><br>For more information about the Command bar, see Show Command Bar Property. |
| **Show Navigate** | Boolean value that determines if a navigate command button is shown in the Command b The default is **true**.<br><br>When true, a user select an alarm from the alarm grid and press the **navigate** command t move to the asset that is in alarm. See also **Navigation on Double Click**, above, under **Ru Time Behavior**. |
| **Show Ack Selected** | Boolean value that determines if the **Show Ack Selected** command button appears on th Command bar. When users select one or more alarms from the grid and select the **Show Selected** command, the selected alarms are acknowledged. |
| **Show Ack All** | Boolean value that determines if the **Show Ack All** command button appears on the Command bar. True is the default to show the **Show Ack All** command.<br><br>After users select the **Show Ack All** command during run time, all alarms are acknowledg |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| **Show Ack Visible** | Boolean value that determines if the **Show Ack Visible** command button appears on the Command bar. True is the default to show the **Show Ack Visible** command.<br>After users select the **Show Ack Visible** command during run time, only those alarms tha are visible in the Alarm grid are acknowledged. |
| **Show Requery** | Boolean value that determines if the **Requery** command button appears on the Comman bar during run time. True is the default to show the **Requery** command.<br>After the **Requery** command is selected, the Alarm app requeries the historical database shows the refreshed alarm data. |
| **Show Connect** | Boolean value that determines if the **Show Connect** command button appears on the Command bar during run time. False is the default to hide the **Show Connect** command.<br>When set to True and users select the **Show Connect** icon, a request is submitted to conn the Alarm app to the historical alarm database. |
| **Show Disconnect** | Boolean value that determines if the **Show Disconnect** command button appears on the Command bar during run time. False is the default to hide the **Show Disconnect** comman<br>When set to True and users select the **Show Disconnect** command, a request is submitte disconnect the Alarm app from the historical alarm database.<br>The **Show Disconnect** command requires a pre-configured Historian connection. |

**Alarm Mode Properties**

| | |
|---|---|
| **Alarm Query** | **Alarm Query** is a read-write property to get or set an alarm query dynamically at runtime can be used to bind a reference to a ViewApp namespace attribute or to an application object attribute. **This query overrides the query configured in the Configuration dialog.**<br>If you select the ViewApp context via a Navigation App (NanOsecOnd or NavBreadcrumbControl), or if the context is set by using the MyViewApp.Navigation namespace, the focus of the Alarm Query grid will not change unless the **Follow Current Context** property is enabled.<br>Conversely, changing the Alarm Query will not change the navigation context or change t context of the ViewApp. The only way to change the focus of the Alarm Query at run time through direct user interaction. You cannot, for example, add a script that will link the actions. For more information about query syntax, see Alarm Query Property.<br>• You can bind an external reference of string type to the Alarm Query.<br>• Users can modify the Alarm Query property at runtime.<br>• The Alarm Query is overridden at run time if **Follow Current Context** is enabled in the alarm property grid.<br>• If the Alarm Query run time property is disabled, the Alarm Query **Configuration** dial value is used as the default. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| **Client Mode** | Read/Write integer value (1-5) that determines the type of alarm data shown in the Alarm app.<br>The **Client Mode** property can dynamically bind to a namespace reference or to an attribu<br>When assigned a value, the **Client Mode** property overrides the client mode value specifi in the **Configuration** dialog box.<br>The following **Client Mode** integer values determine the type of alarm data shown in the Alarm app.<br>1 = Current Alarms, which is the default<br>2 = Recent Alarms and Events<br>3 = Historical Alarms<br>4 = Historical Events<br>5 = Historical Alarms and Events<br>For more information about specifying the type of alarm data to be shown in the Alarm a see Client Mode Property. |

**Area Hierarchy Properties**

| | |
|---|---|
| **Show Area Hierarchy** | The area hierarchy tree view is used to filter alarms by area (within the navigation hierarc of the ViewApp), without changing the context of the ViewApp.<br>**Show Area Hierarchy** is a Boolean value that determines if the area hierarchy tree view appears within the Alarm app. False (default value) hides the area hierarchy tree view.<br>If you select the ViewApp context via a Navigation App (NavTreeControl or NavBreadcrumbControl), or if the context is set by using the MyViewApp.Navigation namespace, the focus of the Alarm Query grid will not change unless the **Follow Current Context** property is enabled.<br>Conversely, changing the Alarm Query will not change the navigation context or change t context of the ViewApp. The only way to change the focus of the Alarm Query at run time through direct user interaction. You cannot, for example, add a script that will link the actions. For more information about query syntax, see Alarm Query Property. |
| **Show Alarm Indicator** | Boolean value that determines if an alarm indicator appears beneath an area name show on the area hierarchy of the Alarm app. True is the default to show alarm indicators. |
| **Hover Color** | Background color that appears when the user hovers directly over an area hierarchy node with a mouse. The default Hover Color value is #FFD3D3D3, which is light gray. |
| **Selection Color** | Selection color that appears when the user selects an area shown in the area hierarchy node. The default Selection Color value is #FFA9A9A9, which is dark gray. |
| **Font Size** | Specifies the font size of area names that appear in the area hierarchy within the Alarm a The default font size is 14 points. |
| **Font Family** | Specifies the font family of area names that appear in the area hierarchy within the Alarm app. Segoe UI is the default font. |

**Event Handlers Property**

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| **Available Events** | Lists all available events of the Alarm app from a list that appears by double-clicking on th data entry field. Select one or more events from the list to create event handlers that can used in scripting.For more information about AlarmApp event handler scripts, see Write a Event Handler Script. |

## Follow Current Context Property

The value assigned to the **Follow Current Context** property determines if the Alarm app responds to context changes and shows alarms for the currently-selected context of the ViewApp. When set to True, the displayed alarms are from the selected area or asset items of a ViewApp navigation model based on the value assigned to the **Only Show Alarms on Current Asset** property. The table that follows shows the displayed alarms based on the different combinations of property values, and references the following navigation hierarchy.

```
Plant [Area]
|_ Plant_Area [Area]
|_ Tank [Asset]
|_ Inlet_Valve [Asset]
|_ Outlet_Valve [Asset]
```

| Follow Current Context | Only Show Alarms on Current Asset | Displayed Alarms |
|---|---|---|
| True | False | The alarm query shows alarms from the current area of the navigation model.<br>If you select an asset under an area, the Alarm app traverses up the navigation hierarchy until it finds the area that contains the selected asset.<br>Alarms are aggregated for the entire area, including all assets contained in the area, and are displayed in the Alarm app grid at run time.<br>**Example:** Selecting `Inlet Valve` from the navigation hierarchy shows the same alarms in the alarm grid as the following alarm query: `\Galaxy!Plant_Area` |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | | |
|---|---|---|
| True | True | The alarm query shows alarms from the current selected asset of the navigation model.<br><br>If you select an asset under an area, the Alarm app displays alarms only for selected asset. If the selected asset is an area, only alarms for the area are displayed. If assets contained by the area have alarms, these alarms are not shown.<br><br>**Example 1:** Selecting `Inlet_Valve` from the navigation hierarchy shows the same alarms in the alarm grid as the following alarm query: `\Galaxy!Plant_Area!Inlet_Valve.*`<br><br>**Example 2:** Selecting `Plant_Area` from the navigation hierarchy shows the same alarms in the alarms grid as the following alarm query: `\Galaxy!Plant_Area!Plant_Area.*` |
| False | False | If **Follow Current Context** is set to False, the value assigned to the **Show Alarms on Selected Asset** property does not have any effect**.**<br><br>No alarms related to the current area or asset are displayed within the Alarm app grid at run time. Instead, the Alarm app shows alarms from the specified query assigned from the **Configuration** dialog or, if configured, from the **Alarm Query** property. |
| False | True | |

## Alarm Query Property

The Alarm app supports standard Galaxy alarm query formats, such as:
`\galaxy!Area_001`

Alarm query syntax is the same for both Current Alarms Mode and Recent Alarms and Events Mode. Queries in Historical Alarms, Historical Events, and Historical Alarms and Events modes are actually Alarm Database queries, which follow rules and syntax for SQL Server database queries.

The AlarmApp also supports relative references for Galaxy alarms in alarm queries. For all alarm modes, relative references are resolved at run time at the point of query to the Alarm Manager or Alarm Database.

You must put the reference part of the alarm query between less-than (<) and greater-than (>) characters.

The following table shows examples of alarm queries.

| Alarm Query | Description |
|---|---|
| \provider!group | Shows all alarms from the given provider and group.<br><br>**Example**<br>`\intouch!Group_A` |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Alarm Query | Description |
|---|---|
| \provider!group!tagname | Shows all alarms from the given provider, group and tag.<br>**Example**<br>`\galaxy!Mixing_Area!RotorCtrl` |
| \\node\provider!group | Shows all alarms from the given provider and group from a given node.<br>**Example**<br>`\\remote\intouch!Group_B` |
| \\node\provider!group!tagname | Shows all alarms from the given provider, group and tag from a given node.<br>**Example**<br>`\\grnode\galaxy!Packaging_Area!Wrapper1` |
| \galaxy!<Area>!<tagname>.* | Shows all alarms from the Automation Object. Alarms from other Automation Objects in the same area are ignored. |
| \galaxy!<myArea.tagname> | Shows all alarms from the Area object hosting the Automation Object |
| \galaxy!<myPlatform.tagname> | Shows all alarms from the Winplatform object hosting the Automation Object. |
| \galaxy!<myEngine.tagname> | Shows all alarms from the AppEngine object hosting the Automation Object. At run-time the Alarm app resolves the myEngine attribute to detect the host. |

## Alarm Queries

For AVEVA OMI, we recommend that you configure Alarm Queries with the Alarm Query property, rather than through the Configuration dialog. The following information is intended for InTouch HMI users:

The run-time alarm comment language switching feature requires slightly different alarm query syntax. In the WinPlatform object, when you enable InTouch alarm provider, you can enable **Register using Galaxy_<GalaxyName>** instead of Galaxy.

This option will register the platform to the alarm subsystem using the Galaxy name preferred by "Galaxy_" instead of just the word "Galaxy". This allows an InTouch application to monitor alarms from multiple Galaxies and avoid name conflicts.

Syntax changes slightly when Galaxy_GalaxyName is enabled:

- Use \\ for computer name
- Use \ for Galaxy or Galaxy_<GalaxyName>
- Use ! for Area

For example: \\Galaxy\MyGalaxy!Area001

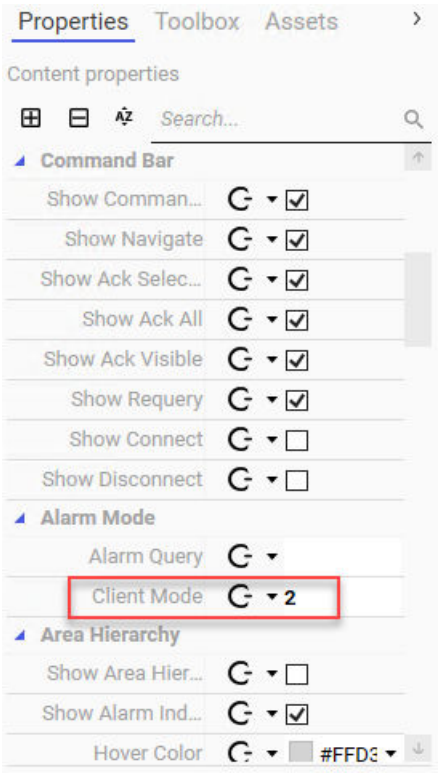
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

If Galaxy_GalaxyName is not enabled in WinPlatform, then the default behavior described in Alarm Queries applies.

You can determine if Galaxy_<GalaxyName> has been enabled by monitoring the run-time attribute of the platform: ITAlarmProvider.ProviderNameAsGalaxyNameEnabled.

## Client Mode Property

You can set the client mode in the Alarm App property grid, under the Alarm Mode category, by entering value from 1 to 5. If you prefer, you can bind an external reference of an integer type to the client mode, instead of setting a static value.




- Client Mode = 1: display current alarms
- Client Mode = 2: display recent alarms & events
- Client Mode = 3: display historical alarms
- Client Mode = 4: display historical events
- Client Mode = 5: display both historical alarms and events

**Note:** The default client mode tab within the Configuration dialog box is “Current Alarms.”

## Show Grid Property

You can bind a Boolean external reference to the Show Grid property.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




- At run time, a user can modify the Show Grid property to show or hide grid lines in the Alarm App.
- If the Show Grid property is disabled at run time, the Alarm App reverts to the configuration value.

## Show Headers Property

You can bind a Boolean external reference to the Show Headers property.

- At run time, a user can modify the Show Headers property to show or hide the Header column on the Alarm App.
- If the user disables the Show Headers property at run time, the Alarm App reverts to the configuration value.

## Show Status Bar Property

You can bind a Boolean external reference to the Show Status property .

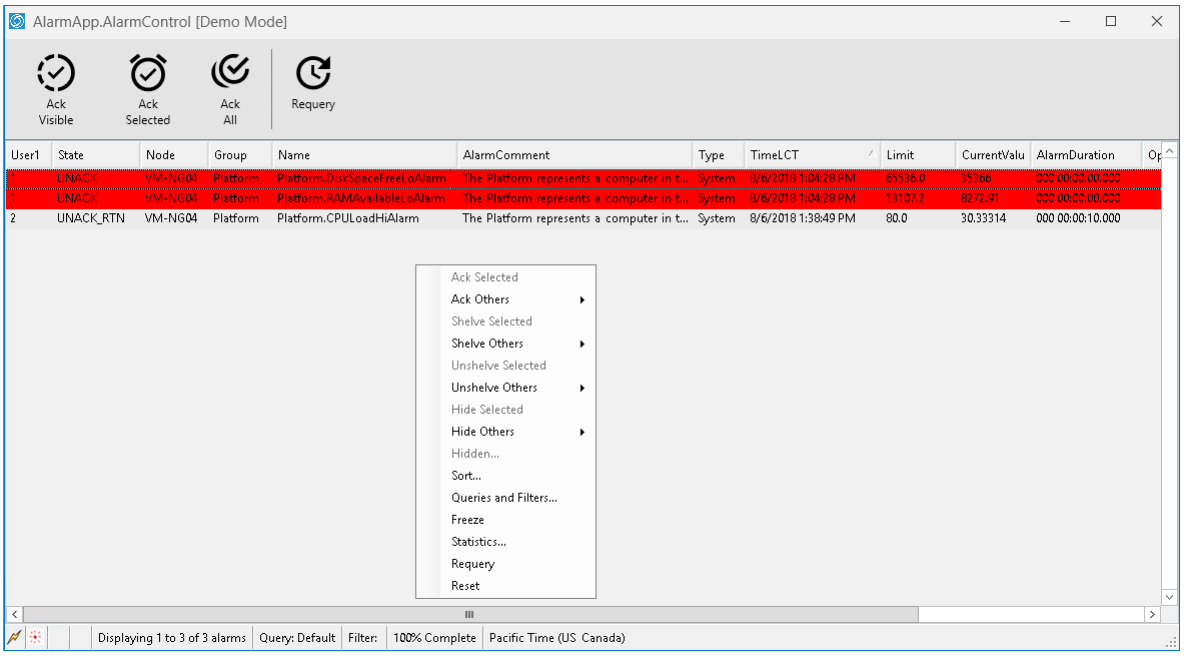
- At run time, a user can User modify the Show Status property to show or hide the status bar in the Alarm App.
- If the Show Status property is disabled at run time, the Alarm App reverts to the configuration value.

## Show Context Menu Property

You can bind a Boolean external reference to the Show Context Menu property.

- At run time, a user can enable or disable the Show Context Menu property.
- If the Show Context Menu property is disabled at run time, the Alarm App reverts to the configuration value.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




**Note**: The default **Show Context Menu** property provides a subset of possible commands that are added to the shortcut menu. For a complete set of context menu commands, see Configure the Run-Time Shortcut Menu.

## Auto Scroll Property

- When the Auto Scroll property is true at run time, the vertical scroll bar on the alarm grid scrolls to the bottom of the alarm grid to show the most recent alarm record.
- When the Auto Scroll property is false at run time, the alarm grid remains at the current view and does not scroll.

## Flash UnAck Alarms Property

- When the Flash UnAck Alarms property is true at run time, unacknowledged alarms will flash in the Alarm App to provide an enhanced indication to the user that there is an unacknowledged alarm.
- When the Flash UnAck Alarms property is false at run time, unacknowledged alarms do not flash in the Alarm App.

## Requires Ack Signature Property

Use the Ack Signature property to bind external references of Boolean type to the Required ACK Signature in the alarm app property grid in alarm mode category.

- Users can modify the Required ACK Signature property at runtime.
- If the Required ACK Signature property is disabled at run time, the Alarm App reverts to the configuration value.

## Ack Min Priority Property

- This property sets the value for Minimum Priority from 1 to 999. Minimum Priority sets the threshold that an alarm must reach to require an acknowledgement signature.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- If the Required Ack Signature property has been changed at run time, the Min Priority property is ignored and all alarms below the Max Priority setting will require an acknowledgement signature.

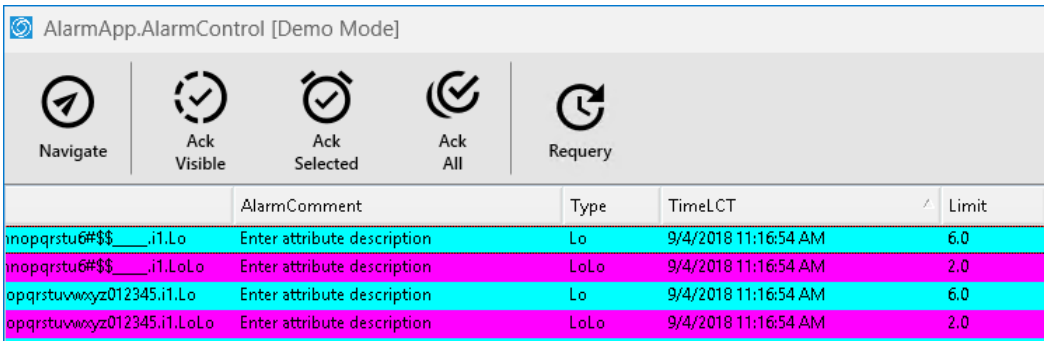
### Ack Max Priority Property

- This property sets the value for Maximum Priority from 1 to 999. Max Priority sets the threshold that an alarm must not exceed to require an acknowledgement signature.
- If the Required Ack Signature property has been changed at run time, the Min Priority property is ignored and all alarms below the Max Priority setting will require an acknowledgement signature.

### Show Command Bar Property

A command bar appears above the alarm grid area of the Alarm app. The command bar shows a set of large icons that represent Alarm app commands, which are recommended for ViewApps that will be displayed on portable touch devices with relatively small screens. Users can simply tap an icon shown on the screen to run the command.

The following figure shows a command bar with the default set of command icons that are selected from the **Properties** page of the ViewApp or Layout editors.

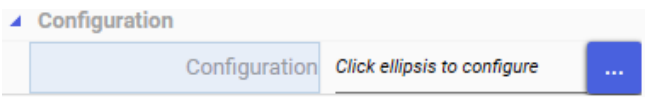



## Set Alarm App Properties

Alarm app properties can be configured from the **Configuration** dialog, which provides access to all properties expected to be modified by users. The **Configuration** dialog sets the initial property values of the Alarm app.

**To configure Alarm app properties**

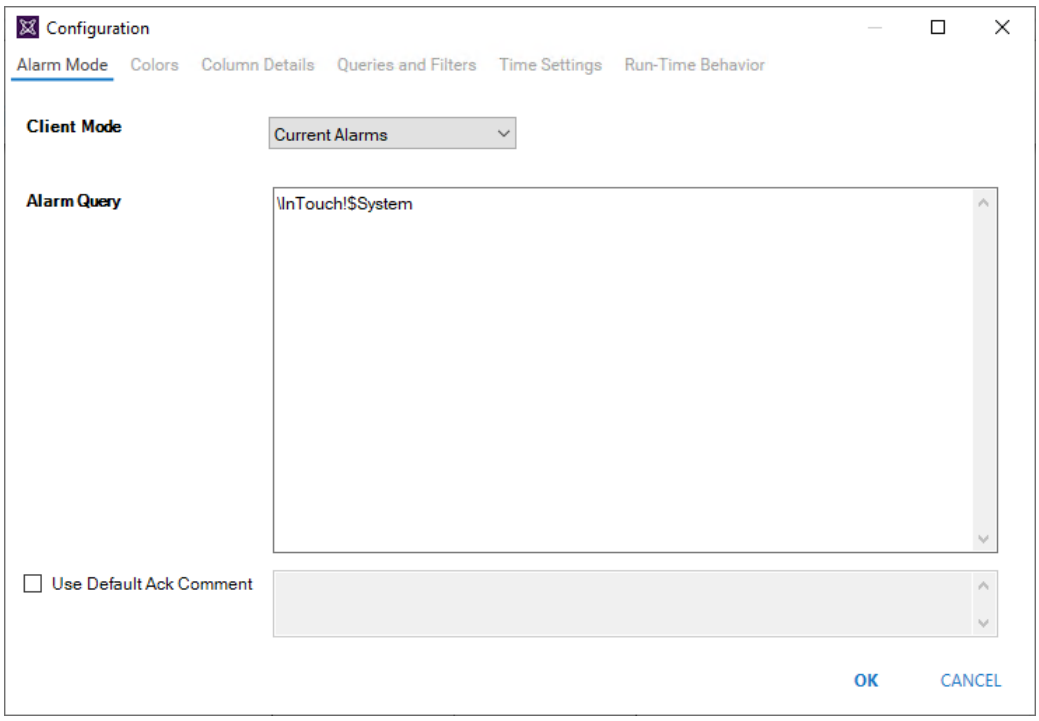
1. Place the Alarm app on a layout pane.
2. Select the Alarm app.
3. Select the **Properties** tab to show Alarm app properties.
4. Locate the **Configuration** property and select the ellipsis button shown at the right of the **Configuration** field.




The **Configuration** dialog box appears with tabs to configure all related properties of the Alarm app.

**Important:** Only use the **Configuration** dialog to configure properties that are not exposed by the **Properties** tab. For example, if you want to configure alarm acknowledgment colors or Time Settings, use the **Configuration** dialog, as these settings cannot be set through the **Properties** tab.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.



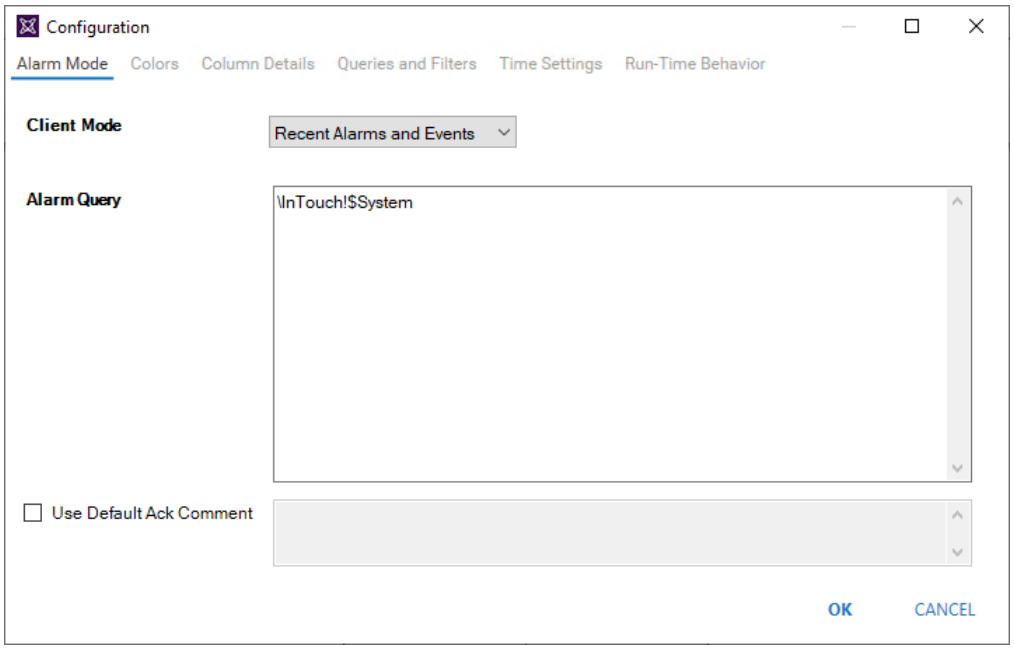

## Show Current Alarms and Events

You use the Client Mode property integer property in scripting to switch the Alarm app to show either current alarms or recent alarms and events at run time.

### To show current alarms

1. Select the Alarm app placed on a pane.
2. If necessary, click **Properties** to show the **Properties** pane. In the properties list, click the ellipsis button ( **...** )next to the **Configuration** field to open the **Configuration** dialog box.
3. If necessary, click the **Alarm Mode** tab**.** The **Alarm Mode** page appears.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




4. In the **Client Mode** list, click **Current Alarms**.
5. In the **Alarm Query** box, type the alarm query. To create a new line in the **Alarm Query** box, press **Ctrl + Enter**. For more information on the valid syntax, see Alarm Query Property.
6. If you want to use a default acknowledgement comment, select the **Use Default Ack Comment** check box and type a comment in the text box.
7. Click **OK**.

### To show recent alarms and events

1. Double-click Alarm app on the canvas. The **Edit Animations** dialog box appears.
2. Click **Alarm Mode**. The **Alarm Mode** page appears.
3. In the **Client Mode** list, click **Recent Alarms and Events**.
4. In the **Alarm Query** box, type the alarm query. To create a new line in the **Alarm Query** box, press **Ctrl + Enter**.

   The alarm query must follow one of the following syntax:

   - \\node\provider!group
   - \provider!group
   - HotBackupName (InTouch HMI only; not applicable to AVEVA OMI)

   For example:

   ```
   \intouch!$system \galaxy!Area_001
   ```

   When the Alarm app is hosted by Automation Object templates or instances, you can specify one of the following alarm queries:

   - \galaxy!<myArea.Tagname> to retrieve alarms and events from the Area object hosting the Automation Object template or instance.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- \galaxy!<Area>!<Tagname>.* to retrieve alarms and events from the Automation Object template or instance.

For more information on alarm queries, see Alarm Queries.

5. If you want to use a default acknowledgement comment, select the **Use Default Ack Comment** check box and type a comment in the text box.
6. Click **OK**.

## Show Historical Alarms and Events

You can set the Alarm app to show one of the following:

- Historical alarms from the Alarm Database
- Historical events from the Alarm Database
- Historical alarms and events from the Alarm Database
- Historical events from History Blocks
- Historical alarms from History Blocks
- Historical alarms and events from History Blocks

When you configure the Alarm app to show historical alarms and/or events, you also configure the following:

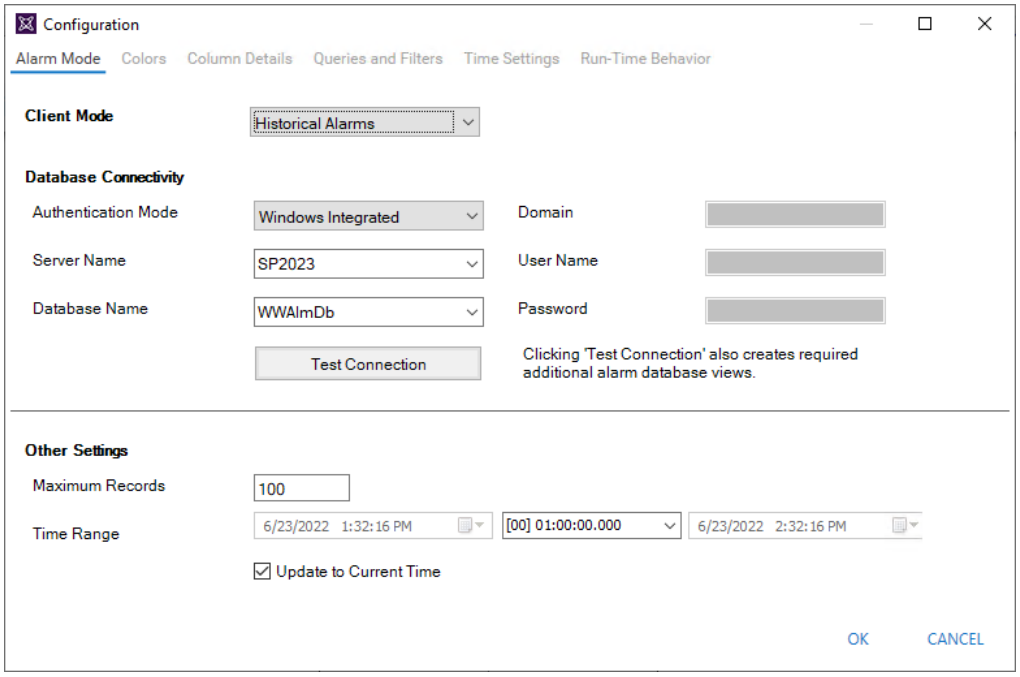
- Server name hosting the Alarm Database
- Authentication information to connect to the Alarm Database
- Maximum number of records to retrieve from the Alarm Database
- Time range or duration to show in the Alarm app
- If the Alarm app should update to the current client time

The Alarm app works with both the ArchestrA Database (A2ALMDB) and with History Blocks.

### To show historical alarms and/or events

1. Select the Alarm App placed on a pane.
2. Select the **Properties** grid to show Alarm App properties.
3. Select the ellipsis button shown at the right of the **Configuration** field.
4. If necessary, click the **Alarm Mode** tab. The **Alarm Mode** page appears.
5. In the **Client Mode** list, click:
   - **Historical Alarms** to only show alarms from the Alarm Database. No events are shown
   - **Historical Events** to only show events from the Alarm Database. No alarms are shown
   - **Historical Alarms and Events** to show both alarms and events from the Alarm Database

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

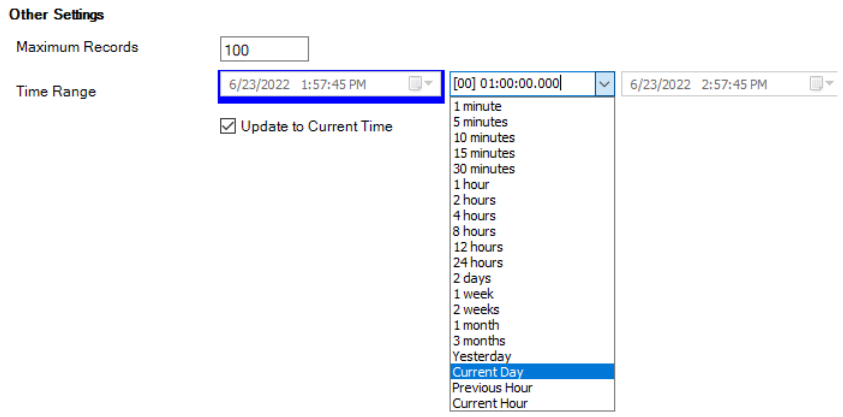



6. In the **Authentication Mode** list, select one of the following:
   - Windows Integrated to use the authentication of the currently logged-on Windows user
   - Windows Account to use a given Windows user authentication
   - SQL Server to use SQL Server authentication mode
7. In the **Server Name** list, either select or type the name of the server hosting the Alarm Database.
8. In the **Database Name** box, type the name of the Alarm Database. For the ArchestrA Database, enter A2ALMDB, and for Historian block storage enter History Blocks.
9. If you are using Windows Account authentication mode, type the domain, user name, and password in the **Domain**, **User Name** and **Password** boxes.
10. If you are using SQL Server authentication mode, type user name and password in the **User Name** and **Password** boxes.
11. Click **Test Connection**. The connection to the Alarm Database is tested and a result message appears. If necessary, check your authentication information.
12. Click **OK**.

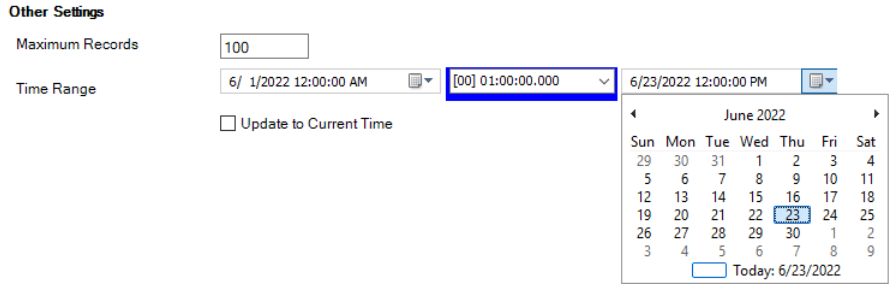
### To set maximum records and time range

1. Show the Alarm app's **Configuration** dialog box.
2. If necessary, click the **Alarm Mode** tab. The **Alarm Mode** page appears.
3. Make sure the **Client Mode** field is set to Historical Alarms, Historical Events, or Historical Alarms and Events.
4. In the **Maximum Records** box, type the number of records to view from the control at one instance. The valid range of maximum records is from 1 to 32766.
5. To set a fixed length interval, select an interval from the middle list of the **Time Range** pickers.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




6. To use a specific start time and end time, clear **Update to Current Time**, and select the start time from the list at the left and the end time from the list at the right of the Time Range pickers.



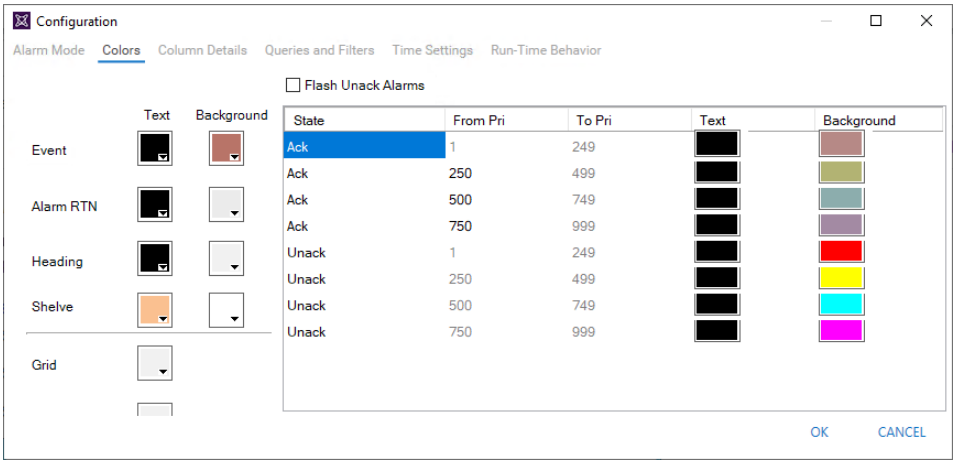

7. Click **OK**.

## Set Alarm Colors

You can show different types of alarm records with different colors to more easily identify certain types of alarms.

You can configure the Alarm Control with priority breakpoints to show alarm records within the resulting priority ranges in different colors.

You can also configure the control background color, the grid color, and the heading colors.



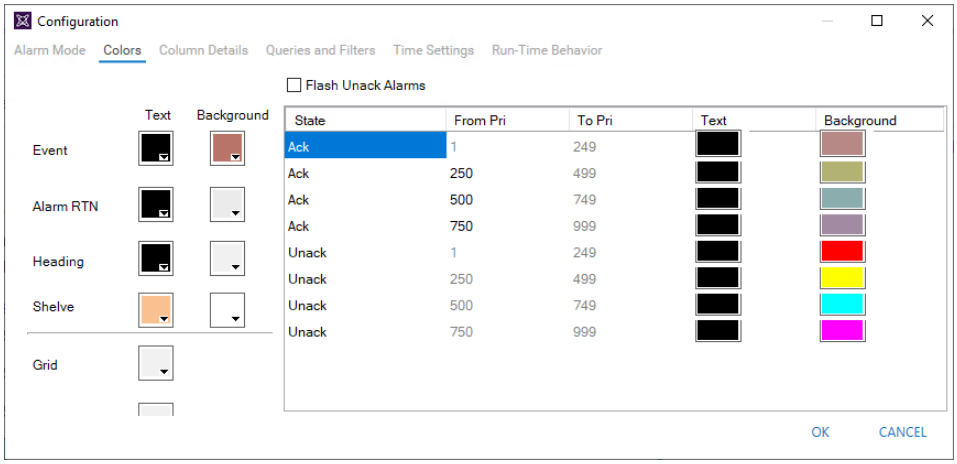

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

## Set Event Record Colors

You can set text color and background color for event records. Use the EventColor.ForeGround Property and EventColor.BackGround Property properties in scripting to set the event alarm record text color and background color at run time.

### To set text and background colors for event records

1. Select the Alarm app placed on a pane.
2. Select the **Properties** grid to show Alarm app properties.
3. Select the ellipsis button shown at the right of the **Configuration** field.




4. Configure the event record text color. Do the following:
   a. Click the color field next to **Event** and under **Text**. The color picker appears.
   b. Select a color and click **OK**.
5. Configure the event record background color. Do the following:
   a. Click the color field next to **Event** and under **Background**. The color picker appears.
   b. Select a color and click **OK**.
6. Click **OK**.

## Set Return to Normal Alarm Record Colors

You can set text color and background color for "return to normal" alarm records.

### To set text and background colors for "return to normal" records

1. Select the Alarm app placed on a pane.
2. Select the **Properties** grid to show Alarm app properties.
3. Select the ellipsis button shown at the right of the Configuration field.
4. Click the **Colors** tab. The **Colors** page appears.
5. Configure the "return to normal" record text color. Do the following:
   a. Click the color field next to **Alarm RTN** and under **Text**. The color picker appears.
   b. Select a color and click **OK**.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

6. Configure the "return to normal" record background color. Do the following:
    a. Click the color field next to **Alarm RTN** and under **Background**. The color picker appears.
    b. Select a color and click **OK**.
7. Click **OK**.

### Set Heading, Grid, and Window Color

You can set text color and background color for the heading, the grid color, and the Alarm app window color. Use the corresponding HeadingColor.ForeGround Property, HeadingColor.BackGround Property, GridColor Property, and WindowColor Property properties in scripting to set the colors for heading, grid, and window.

**To set heading, grid, and window color for the Alarm app**

1. Select the Alarm app placed on a pane.
2. Select the Properties grid to show Alarm app properties.
3. Select the ellipsis button shown at the right of the Configuration field.
4. Click the **Colors** tab. The **Colors** page appears.
5. Do one of the following:
    a. Configure the heading text color by clicking the color box next to **Heading** and under **Text**. If the color box does not open, you need to select the **Show Heading** option on the **Run-Time Behavior** page first.
    b. Configure the heading background color by clicking the color box next to **Heading** and under **Background**. If the color box does not open, you need to select the **Show Heading** option on the Run-**Time Behavior** page first.
    c. Configure the grid color by clicking the color box next to **Grid**. If the color box does not open, you need to select the **Show Grid** option on the **Run-Time Behavior** page first.
    d. Configure the window color by clicking the color box next to Window.

### Set Alarm Shelving Colors

You can set text color and background color for alarms that are temporarily shelved.

#### To set alarm shelved colors

1. Select the Alarm app placed on a pane.
2. Select the **Properties** grid to show Alarm app properties.
3. Select the ellipsis button shown at the right of the **Configuration** field.
4. Click the **Colors** tab. The **Colors** page appears.
5. Configure the shelve record text color. Do the following:
    a. Click the color field next to **Shelve** and under Text. The color picker appears.
    b. Select a color and click **OK**.
6. Configure the shelve record background color. Do the following:
    a. Click the color field next to **Shelve** and under **Background**. The color picker appears.
    b. Select a color and click **OK**.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

7. Click **OK**.

## Set Priority Ranges for Alarm Records

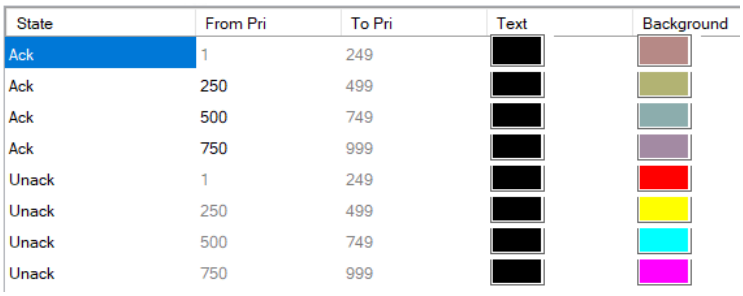
You can use alarm priority ranges to filter alarms. The Alarm app can show alarms within a given range with a different text and background color.

The Alarm app supports four alarm ranges defined by three breakpoints:

1 < breakpoint 1 < breakpoint 2 < breakpoint 3 < 999

### To set priority ranges for alarm records

1. Select the Alarm app placed on a pane.
2. Select the **Properties** grid to show Alarm app properties.
3. Select the ellipsis button shown at the right of the **Configuration** field.
4. Click the **Colors** tab. The **Colors** page appears.
5. In the **From Pri** column in the list at the right, locate the break point you want to change. These are values except 1 or 999.
6. Click the value and type a new value in the range between the previous breakpoint and the next breakpoint.




7. Press **Enter**. All priority values in the list are updated.
8. 8. Click **OK**.

## Set Colors for Acknowledged Alarms

You can set the text and background colors for records of acknowledged alarms. For each of the alarm priority ranges, you can set a text color and a background color.

### To set colors for acknowledged alarm records

1. Select the Alarm app placed on a pane.
2. Select the **Properties** grid to show Alarm app properties.
3. Select the ellipsis button shown at the right of the **Configuration** field.
4. Click the **Colors** tab. The **Colors** page appears.
5. In the list at the right, locate the Ack record and priority range for which you want to change the text or background color.
6. Click the color box in the **Text** or **Background** column of the line. The color picker appears.
7. Select a color.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

8. Click **OK**.

## Set Colors for Unacknowledged Alarms

You can set the text and background colors of unacknowledged alarm records. For each of alarm priority range, you can set a text color and a background color.

### To set colors for unacknowledged alarm records

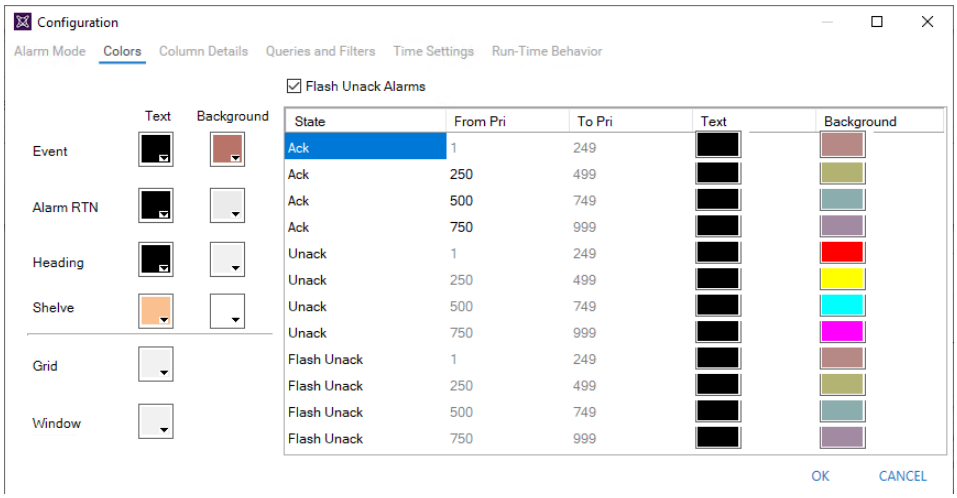
1. Select the Alarm app placed on a pane.
2. Select the **Properties** grid to show Alarm app properties.
3. Select the ellipsis button shown at the right of the **Configuration** field.
4. Click the **Colors** tab. The **Colors** page appears.
5. In the list at the right, locate the **Unack** record and priority range for which you want to change the text or background color.
6. Click the color box in the **Text** or **Background** column of the line. The color picker appears.
7. Select a color and click **OK**.

## Set Unacknowledged Alarms to Flash

Instead of showing unacknowledged alarm records in predefined constant text and background color, you can configure the Alarm app to flash unacknowledged alarms repetitively in other text and background colors to identify unacknowledged alarms more quickly

### To set flashing and colors for unacknowledged alarm records

1. Select the Alarm app placed on a pane.
2. Select the **Properties** grid to show Alarm app properties.
3. Select the ellipsis button shown at the right of the **Configuration** field.
4. Click the **Colors** tab. The **Colors** page appears.
5. Select the **Flash Unack Alarms** check box.



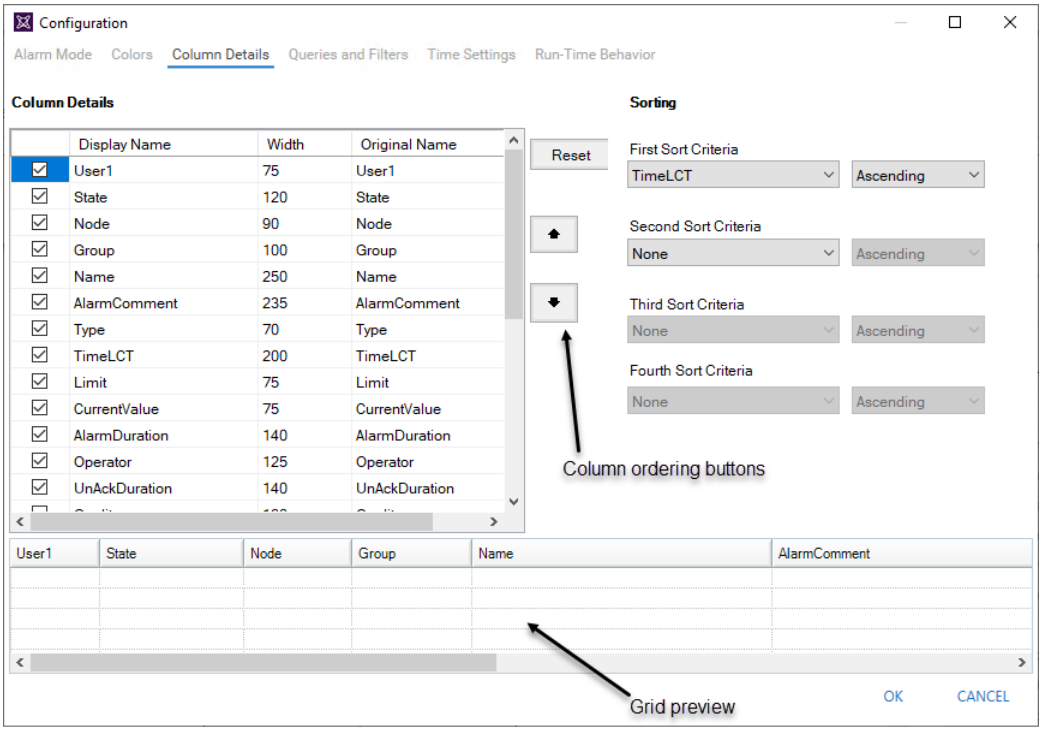

**Note**: You cannot select the Flash UnAck Alarms check box if the Client Mode property is set to one of the historical data modes.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

6. In the list on the right, locate the Unack record and priority range for which you want to change the text or background color. Do the following:
   a. Click the color box in the **Text** or **Background** column of the line. The color picker appears.
   b. Select a color and click **OK**.
7. Locate the **Flash Unack record** and priority range for which you want to change the text or background color. Do the following:
   a. Click the color box in the **Text** or **Background** column of the line. The color picker appears.
   b. Select a color and click **OK**.
8. Click **OK**.

## Rename, Resize, and Reorder Column Headers

You can rename, resize, and change the order of columns in the Alarm app. You can also change which columns the alarm list is sorted by.




All changes you make in the **Column Details** list are shown in the grid preview. You can also use the grid preview to resize columns or change their order by dragging and dropping the column headers.

Column headers can be localized along with other graphic text when you export, translate, and re-import language files. The translated language files must be imported to support run-time language switching.

**Important**: If you rename or reorder column headers, you must repeat the graphic text translation procedures. If you do not, your changes will not be available for run-time language switching.

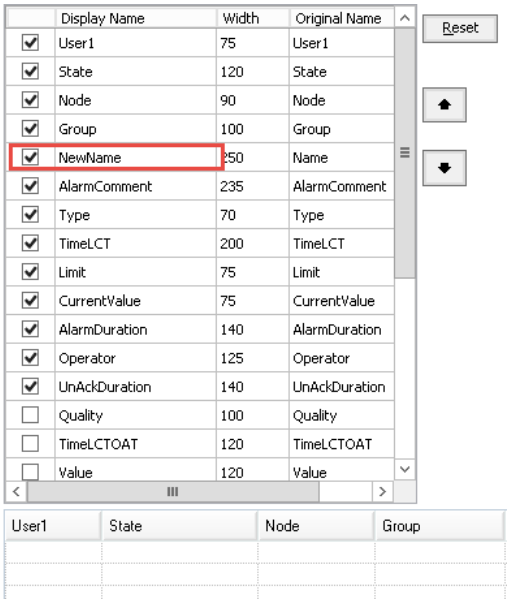
### Rename Column Headers

You can rename the column headers in the Alarm app.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### To rename column headers

1. Select the Alarm app placed on a pane.
2. Select the **Properties** grid to show Alarm app properties.
3. Select the ellipsis button shown at the right of the Configuration field.
4. Click the **Column Details** tab. The **Column Details** page appears.
5. In the **Column Details** list, locate the column header you want to rename and click on it.
6. Type a new name and press **Enter**. The **Column Details** list and the grid preview are updated with the new name.




7. Click **OK**.

## Resize Columns

You can resize the column headers in the Alarm app by:

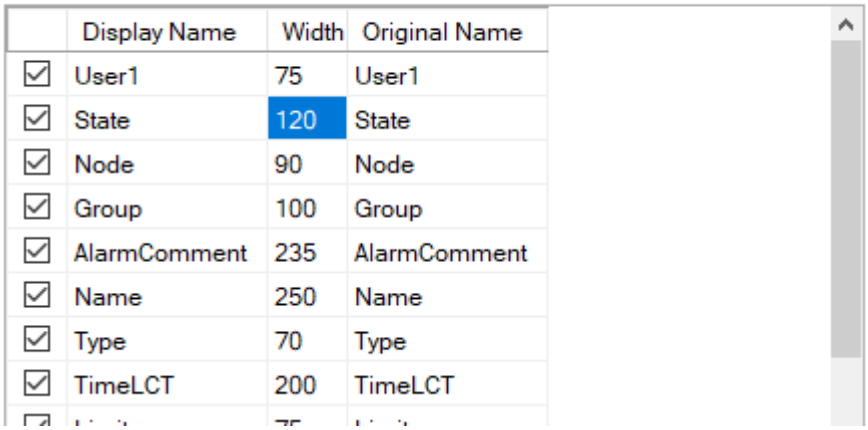
- Entering a numeric size value
- Dragging the column header boundary width with the pointer in the grid preview

### To resize the column numerically

1. Select the Alarm app placed on a pane.
2. Select the **Properties** grid to show Alarm app properties.
3. Select the ellipsis button shown at the right of the **Configuration** field.
4. Click the **Column Details** tab. The **Column Details** page appears.
5. In the **Column Details** list, click the **Width** value of the column to resize.
6. Type a new width in pixels and press **Enter**. The **Column Details** list and the grid preview are updated.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

**Column Details**



| | Display Name | Width | Original Name |
|---|---|---|---|
| ☑ | User1 | 75 | User1 |
| ☑ | State | 120 | State |
| ☑ | Node | 90 | Node |
| ☑ | Group | 100 | Group |
| ☑ | AlarmComment | 235 | AlarmComment |
| ☑ | Name | 250 | Name |
| ☑ | Type | 70 | Type |
| ☑ | TimeLCT | 200 | TimeLCT |

7. Click **OK**.

**Note**: To set all column properties (width, names, and sort order) back to their original values, click **Reset**.

### Change the Order of Columns

You can change the order of the columns in the Alarm app by:

- Moving column names up and down in the Column Details list using buttons
- Dragging the column header with the pointer in the grid preview

You also can reset the column widths and order to their default values. Resetting the column widths and order also resets the names to their default values.

#### To change the column order

1. Select the Alarm app placed on a pane.
2. Select the **Properties** grid to show Alarm app properties.
3. Select the ellipsis button shown at the right of the **Configuration** field.
4. Click the **Column Details** tab. The **Column Details** page appears.
5. Do one of the following:
   - Select the column in the **Column Details** list and click the up or down arrow to move it right or left in the display.
   - In the grid preview, drag and drop the name of the column you want to move.

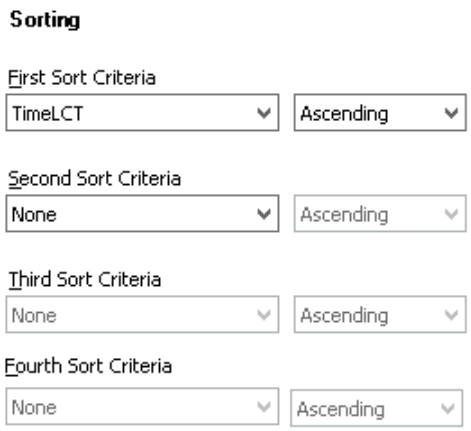
     The grid preview and the **Column Details** list shows the new column order.
6. Click **OK**.

## Sort Alarms

You can configure how the Alarm app sorts alarm records at run time. By default, the Alarm app lists alarm records by time in ascending order.

You can sort alarm records in ascending or descending order based on a primary column, an optional secondary sort column, and an optional tertiary sort column.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




You can configure the sorting columns and directions either in lists or with the grid preview.

### To set sorting columns and directions with lists

1. Select the Alarm app placed on a pane.
2. Select the **Properties** grid to show Alarm app properties.
3. Select the ellipsis button shown at the right of the **Configuration** field.
4. Click the **Column Details** tab. The **Column Details** page appears.
5. In the Sorting area, do the following:
    a. Select the primary sort column in the **First Sort Column** list and a sorting direction in the list to its right.
    b. Optionally, select the secondary sort column in the **Second Sort Column** list and a sorting direction in the list to its right.
    c. If you set the **Second Sort Column**, optionally select the tertiary sort column in the **Third Sort Column** list and a sorting direction in the list to its right.

The grid preview is updated and shows arrows for the sorted columns and their sort directions.




### To set sorting columns and directions with the grid preview

1. Select the Alarm app placed on a pane.
2. Select the **Properties** grid to show Alarm app properties.
3. Select the ellipsis button shown at the right of the **Configuration** field.
4. Click the **Column Details** tab. The **Column Details** page appears.
5. In the grid preview, click on a column to select it for sorting. An arrow appears on the column header and the change is also shown in the Sorting area lists.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

6. To change the sorting direction, click on the column header again. The arrow changes on the column header and the change is also shown in the Sorting area lists.

   **Note**: If you click on a column header after releasing the Shift key, all sorting information is lost and the selected column is the new primary sorting criteria.

7. To set secondary and tertiary sorting, hold the Shift key and repeat from step 5.
8. Release the Shift key.
9. Click **OK**.

## Filter Alarms

You can filter current and historical alarms by using query filters. A query filter is a collection of filter criteria in a logical construct.

For example, you can filter alarms by defining a query filter that only shows alarms with priorities larger than 500 and smaller than 750.

You can re-use the filter queries you define for historical alarms for current alarms and vice versa. You can also re-use filter queries you define at design-time at run time and vice versa.

**Important**: Query filters for current alarms and recent alarms and events require at least **Provider** and **Group** as filter criteria. These must use the equal sign.

When you use TimeLCT, TimeOAT, or TimeLCTOAT as filter criteria for historical alarm modes, you must ensure that the TimeSelector.StartDate and TimeSelector.EndDate properties do not limit the query. Otherwise, the Alarm app can possibly not return all alarm and event records.

Set the TimeSelector.StartDate property earlier than any time filtering requirement, and the TimeSelector.EndDate later than any time filtering requirement.

### Using Wildcards in Queries

In current alarm queries, you can use wildcards only in the Tagname part of the query and not in the Provider, Group, or Node part of the query. A valid example is:

```
\galaxy!Mixing!RotorBlade*
```

In query filters that are used for historical queries, you must convert the operator and wildcard to SQL syntax according to the following table:

| | **Current Query** | **Historical Query** |
|---|---|---|
| Operator | = | Like |
| Wildcard | * | % |

For example:

```
Provider = ‘galaxy’ AND Group = ‘Mixing’ AND Name Like ‘RotorBlade%’
```

If you want to use a query filter containing a wildcard for a current query and a historical query, create two separate query filters.

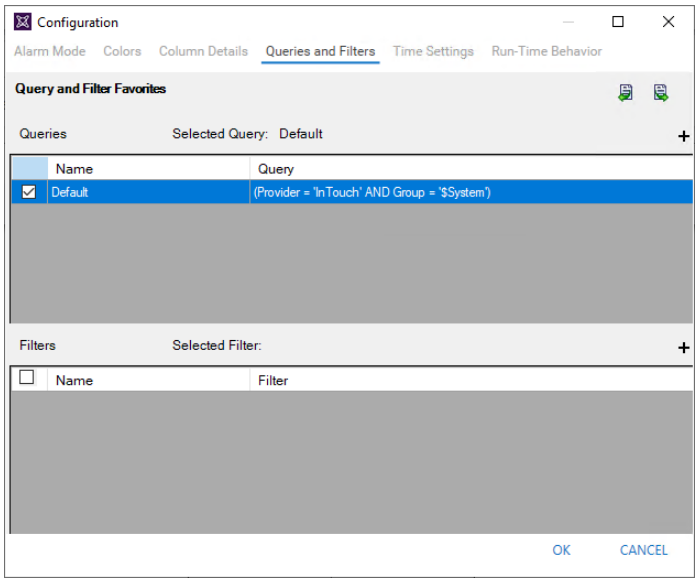
### Use an Existing Query

You can use an existing query filter to filter the alarms shown in the Alarm app.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### To use an existing query filter

1. Select the Alarm app placed on a pane.
2. Select the **Properties** grid to show Alarm app properties.
3. Select the ellipsis button shown at the right of the **Configuration** field to show the Alarm app's **Configuration** dialog box.
4. Click the **Queries** and **Filters** tab. The **Query** and **Filter** Favorites page appears.




5. In the **Queries** list, select a query filter.
6. Click **OK**.

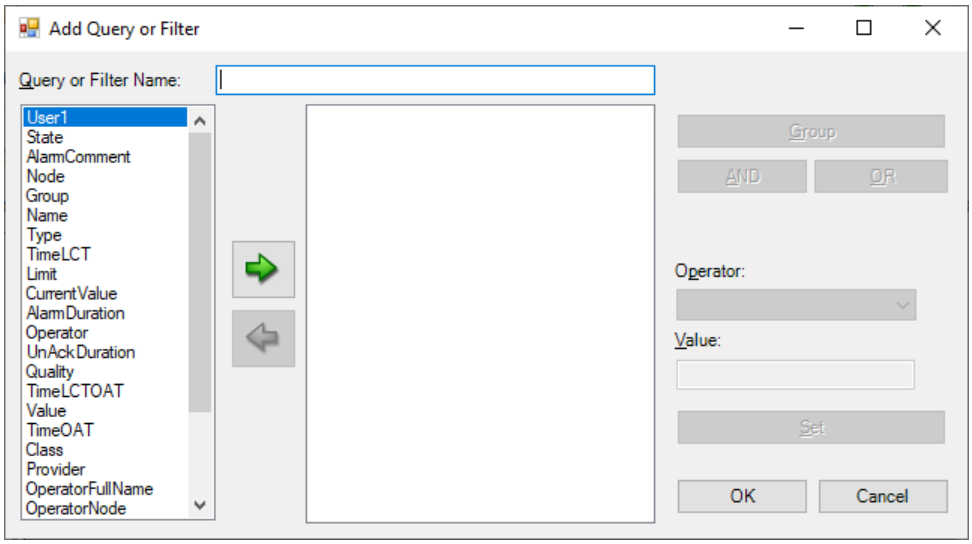
## Add a New Query Filter

You can define a new query filter to filter the alarms shown in the Alarm app. The new query filter is saved as a favorite in the **Query Filter Favorites** list.

### To add a new query filter

1. Select the Alarm app placed on a pane.
2. Select the **Properties** grid to show Alarm app properties.
3. Select the ellipsis button shown at the right of the Configuration field.
4. Click the **Queries and Filters** tab. The **Query and Filter Favorites** page appears.
5. Select the **Add** button at the right of the Queries area. The **Add Query or Filter** dialog box appears.

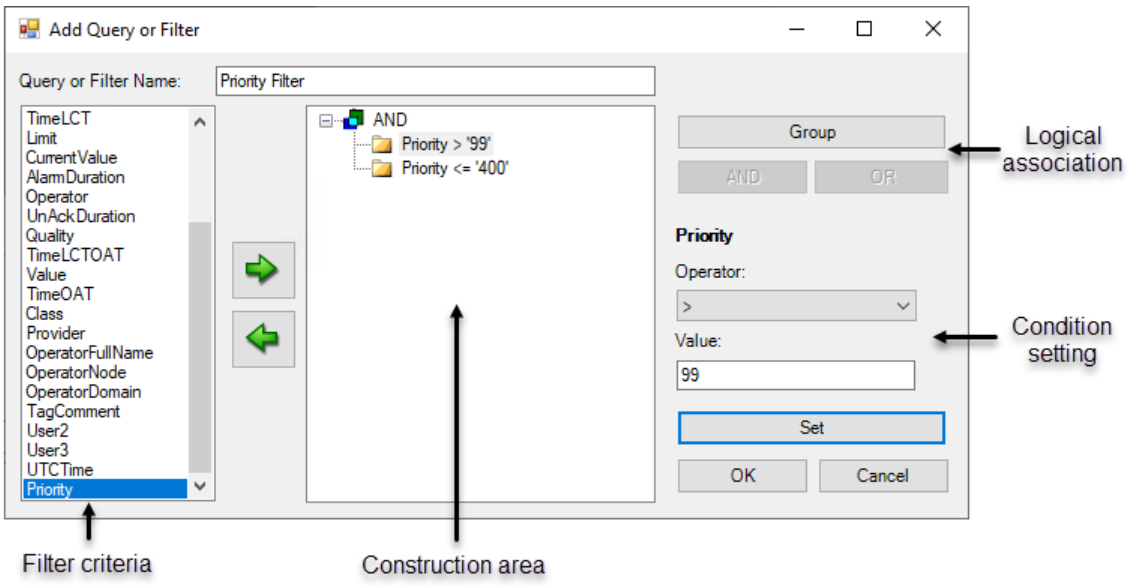
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




6. Construct queries or filters as needed.

## Construct Filters

You use the **Add Query or Filter** dialog box to create or edit a filter graphically.




### To construct a filter

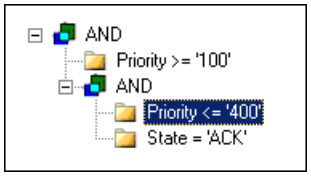
1. If you want to change the filter name, type a new unique name in the **Filter Name** box.
2. Add filter criteria to the construction area by selecting a column name on the left and clicking the right arrow button. When you add filter criteria to the construction area, they are automatically logically connected by AND.




© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

3. If necessary, remove filter criteria by selecting them in the filter construction area and clicking the left arrow button.
4. To change the logical operator, select it in the filter construction area, and then either:
   - Click **AND** or **OR**
   - Right-click and select **AND** or **OR** from the shortcut menu
5. To group filter criteria logically, either:
   - Drag a filter criteria in the construction area over another filter criteria
   - Select one filter criteria, click **Group**, and then click the other filter criteria

   By default, the filter criteria are logically grouped with **AND**. If necessary, you can select the **AND** item in the tree and click **OR** to change it to an OR grouping.




6. Assign values to filter criteria.

   **Note**: If you are using the Value column as a filter criteria, you may get unexpected results at run time. The items in the Value column are sorted alphabetically, not numerically. This is because the Value column can contain strings.

   Do the following:

   a. Select a filter criteria in the construction area.
   b. Select an operator from the **Operator** list.
   c. Type or select a value in the **Value** box.
   d. Click **Set**. The filter criteria is updated in the construction area.
7. To cut, copy, or paste individual filter criteria or filter criteria branches, right-click on the filter criteria and select the appropriate option from the shortcut menu.
8. When you are done, click **OK**.

## Modify an Existing Query Filter

You can modify an existing query filter using the Modify Filter dialog box.

### To modify an existing query filter

1. Select the Alarm app placed on a pane.
2. Select the **Properties** grid to show Alarm app properties.
3. Select the ellipsis button shown at the right of the Configuration field.
4. Click the **Queries and Filters** tab. The **Query and Filter** Favorites page appears.
5. Select an existing query filter in the **Filters** list.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

6. Click the ellipsis button under the **Details** column at the far right of the list. The **Modify Query or Filter** dialog box appears. For more information, see Construct Filters.
7. Click **OK**.

### Delete a Query Filter Favorite

You can delete any non-default query filter favorites.

#### To delete a query filter favorite

1. Select the Alarm app placed on a pane.
2. Select the **Properties** grid to show Alarm app properties.
3. Select the ellipsis button shown at the right of the Configuration field.
4. Select the Queries and Filters tab. The **Query and Filter Favorites** page appears.
5. Select an existing query filter in the **Query Filter Favorites** list.
6. Click the **Delete** button.
7. When a message appears, click **Yes**.

### Export Query Filter Favorites

You can export the query filter favorites list to an XML file. The XML file containing the query filter favorites can be imported to another Alarm app in design time or run time. Do not edit this file directly. The default query filter favorite is not exported to the XML file.

#### To export the query filter favorites list

1. Select the Alarm app placed on a pane.
2. Select the **Properties** grid to show Alarm app properties.
3. Select the ellipsis button shown at the right of the Configuration field.
4. Click the **Queries and Filters** tab. The **Query and Filter Favorites** page appears.
5. Click the **Export** button. The **Export Query Filter Favorites** dialog box appears.
6. Select a location and a name for the XML file and click **Save**.

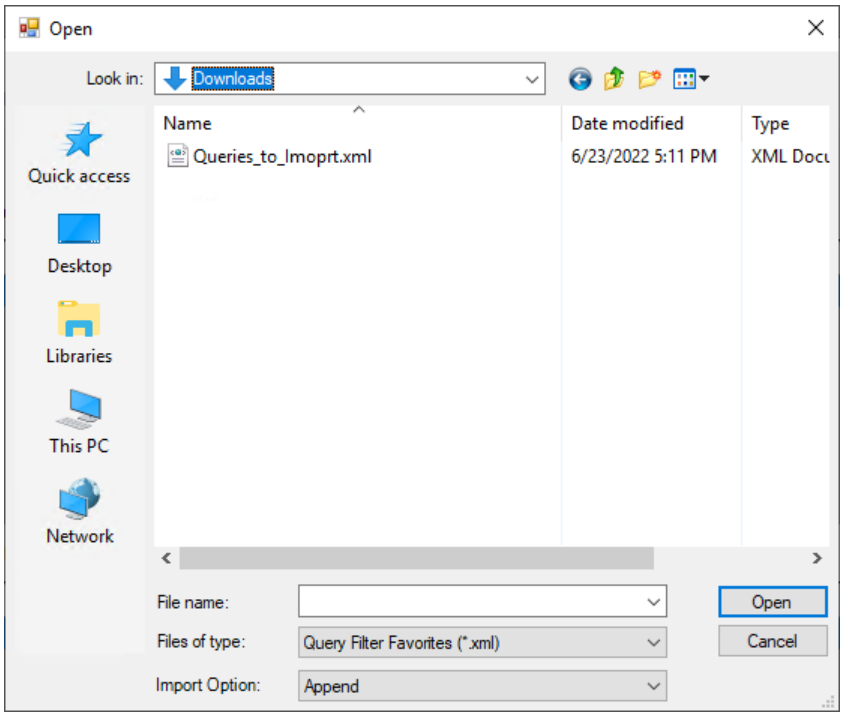
### Import Query Filter Favorites

You can import the query filter favorites list from an XML file.

#### To import the query filter favorites list

1. Select the Alarm app placed on a pane.
2. Select the **Properties** grid to show Alarm app properties.
3. Select the ellipsis button shown at the right of the Configuration field.
4. Click **Query Filters**. The **Query Filters** page appears.
5. Click **Import**. The Import **Query Filter Favorites** dialog box appears.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




6. In the **Import Option** list, select either:
   - **Append** to append the imported query filters to the existing query filters. If query filter names in the imported XML conflict with existing query filters, you are prompted to confirm the import for each filter
   - **Overwrite** to replace all existing query filters with the imported query filters
7. Browse to the XML file and click **Open**.

## Set Time Zone and Format

You can set the time zone in which the Alarm app shows the alarm and event records. By default, the time zone is set to the client computer's current time zone at design time.

You can set the time format of the alarm and event records. You can select between two different time format sets:

- Default Time Format
- .NET Time Format

| Default Time Format | .NET Time Format |
|---|---|

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Format Options | |
|---|---|
| %m - | Two-digit month |
| %b - | Three-letter month |
| %B - | Full month name |
| %d - | Two digit day |
| %Y - | Four-digit year |
| %y - | Two-digit year |
| %#x - | Full day and date |
| %H - | Hours (24 hour format) |
| %I - | Hours (12 hour format) |
| %M - | Minutes |
| %S - | Seconds |
| %s - | Milliseconds |
| %p - | AM or PM display |

| .NET Time Format | |
|---|---|
| MM - | Two-digit month |
| MMM - | Three-letter month |
| MMMM - | Full month name |
| dd - | Two digit day |
| yyyy - | Four-digit year |
| yy - | Two-digit year |
| | |
| HH - | Hours (24 hour format) |
| hh - | Hours (12 hour format) |
| mm - | Minutes |
| ss - | Seconds |
| fff - | Milliseconds |
| tt - | AM or PM display |

### Set the Time Zone

You can set the time zone in which the Alarm app shows the alarm and event records.

You can either set the time display to a predefined time zone, or to the client time zone. The client time zone is the time zone of the computer on which the Alarm app is running.

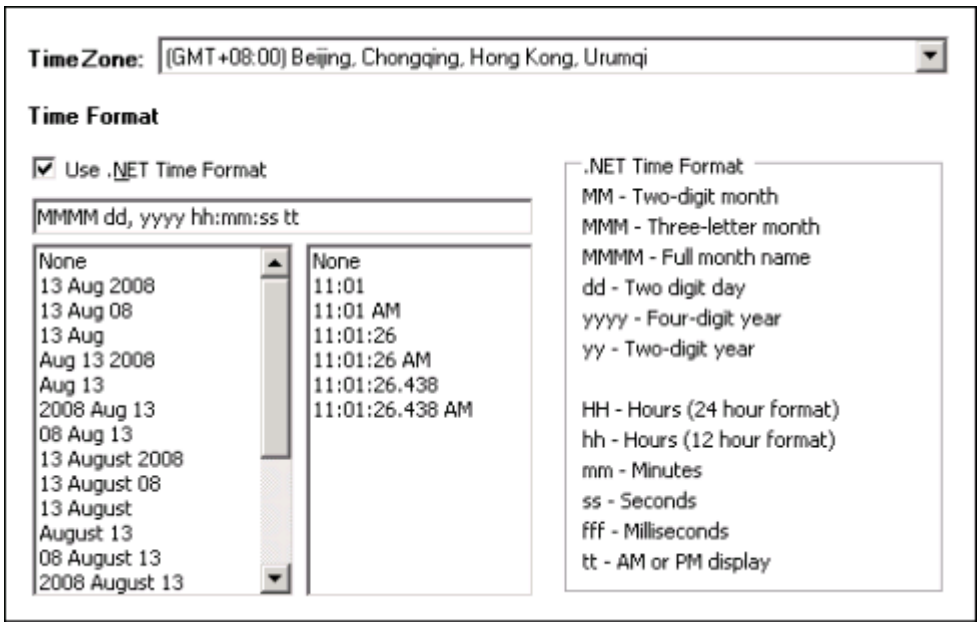
The **Client Time Zone** setting is useful if you are deploying an application using the Alarm app to a different time zone.

For example, if you develop your application in the Pacific Time zone and deploy it to two computers in the time zones Central Time and Eastern Time, you can ensure the Alarm app shows the local time for each deployment by setting the time zone to Client Time Zone.

#### To set the time zone

1. Select the Alarm app placed on a pane.
2. Select the **Properties** grid to show Alarm app properties.
3. Select the ellipsis button shown at the right of the **Configuration** field to show the Alarm app's **Configuration** dialog box.
4. Click the **Time Settings** tab. The **Time Settings** page appears.
5. In the **Time Zone** field, select a time zone.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




6. Click **OK**.

### Set a Time Format

You can set the time format in which the Alarm app shows the alarm and event records. You can either use a predefined datetime format, or compose one.

#### To set the time format

1. Select the Alarm app placed on a pane.
2. Select the **Properties** grid to show Alarm app properties.
3. Select the ellipsis button shown at the right of the **Configuration** field to show the Alarm app's **Configuration** dialog box.
4. Select the **Time Settings** tab.
5. In the Time Format area, do the following:
   a. Make sure Use .NET Time Format is cleared.
   b. Select date format codes from the list at the right. The equivalent date format code appears in the box above.
   c. Select time format codes from the list at the right. The equivalent time format code is appended to the date format string.

   If you want to customize the datetime format, modify the codes in the box as follows:

| Code | Purpose | Example |
|---|---|---|
| %m | Two-digit month | 03 |
| %b | Three-letter month | Mar |
| %B | Full month name | March |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | | |
|---|---|---|
| %d | Two-digit day | 17 |
| %Y | Four-digit year | 2018 |
| %y | Two-digit year | 18 |
| %#x | Full day and date | Monday, March 26, 2018 |
| %H | Hours in 24 hour format | 14 |
| %I | Hours in 12 hour format | 2 |
| %M | Minutes | 54 |
| %S | Seconds | 34 |
| %s | Milliseconds | 333 |
| %p | AM or PM | PM |

6. Click **OK**.

### Set a .NET Time Format

You can set the .NET datetime format in which the Alarm app shows the alarm and event records. You can either use a predefined datetime format, or compose one. The predefined date format is based on the short date format setting of the operating system and may vary from computer to computer.

#### To set the .NET datetime format

1. Select the Alarm app placed on a pane.
2. Select the **Properties** grid to show Alarm app properties.
3. Select the ellipsis button shown at the right of the **Configuration** field to show the Alarm app's **Configuration** dialog box.
4. Click **Time Settings**. The **Time Settings** page appears.
5. In the **Time Format** area, do the following:
   a. Select the Use .NET Time Format check box.
   b. Select date format codes from the list at the right. The equivalent date format code appears in the box above.
   c. Select time format codes from the list at the right. The equivalent time format code is appended to the time format string.
6. If you want to customize the datetime format, modify the codes in the box as in the table below. For more information, see the Microsoft Knowledge database on .NET datetime formats.

| **Code** | **Purpose** | **Example** |
|---|---|---|
| M | Single-digit month | 9 |
| MM | Two-digit month | 04 |
| MMM | Three-letter month | Mar |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | | |
|---|---|---|
| MMMM | Full month name | March |
| d | Single-digit day | 3 |
| dd | Two-digit day | 03 |
| ddd | Abbreviated day of the week | Mon |
| dddd | Day of the week | Monday |
| yyyy | Four-digit year | 2018 |
| yy | Two-digit year | 18 |
| HH | Hours in 24 hour format | 13 |
| hh | Hours in 12 hour format | 10 |
| mm | Minutes | 33 |
| ss | Seconds | 34 |
| | | |
| fff | Milliseconds | 234 |
| tt | AM or PM | PM |

7. Click **OK**.

## Configure Runtime Behavior

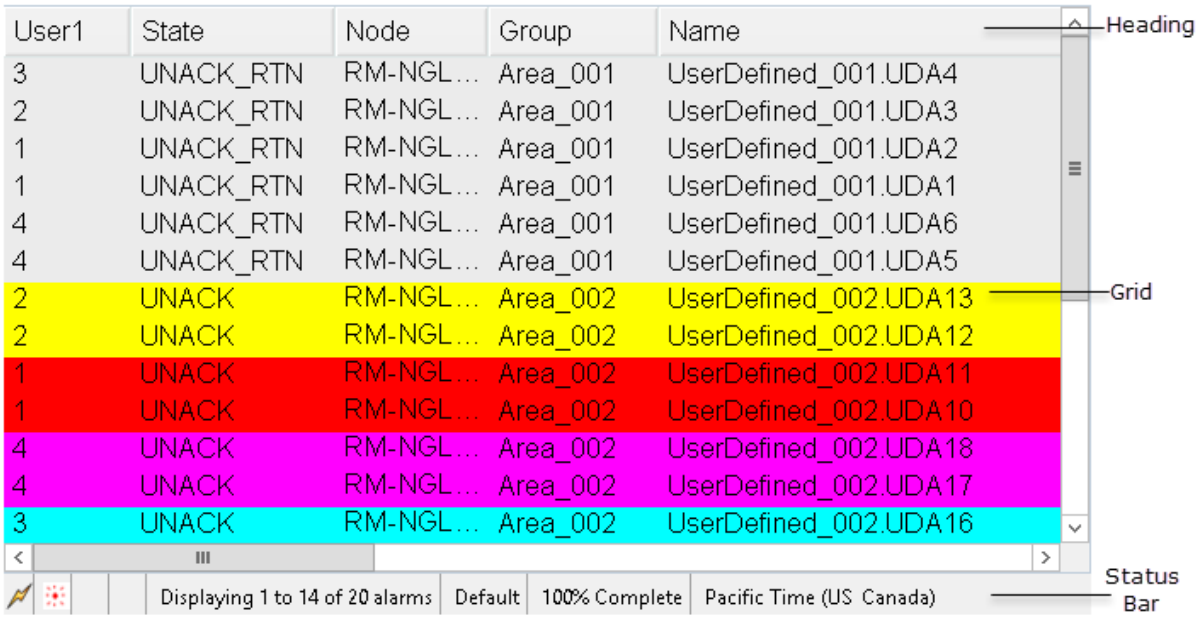
You can configure the behavior and appearance of the Alarm app at run time, for example:

- Showing and Hiding parts of the Alarm app
- Specifying if the Alarm app queries the alarm database when it starts up
- Scrolling to new alarms
- Hiding warnings, errors, and messages
- Restricting operator access to parts of the Alarm app
- Specifying Alarm app freeze behavior
- Customizing the "no records" message
- Configuring alarms to require an ACK signature
- Configuring alarms to require a SHELVE signature
- Customizing the run-time shortcut menu

### Show Heading, Grid, or Status Bar

You can show and hide parts of the Alarm app at run time, such as the heading, grid, or status bar.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




**To show the heading, grid, or status bar at run time**

1. Select the Alarm app placed on a pane.
2. Select the **Properties** grid to show Alarm app properties.
3. Select the ellipsis button shown at the right of the **Configuration** field to show the Alarm app's **Configuration** dialog box.
4. Click **Run-Time Behavior**. The **Run-Time Behavior** page appears.
5. To show or hide parts of the Alarm app during run time, do any of the following:
   - Select the **Show Heading** check box to show the heading at run time, or clear it to hide the heading at run time.
   - Select the **Show Grid** check box to show the grid at run time, or clear it to hide the grid at run time.
   - Select the Show Status Bar check box to show the status bar at run time, or clear it to hide the status bar at run time.

   **Important**: If you hide the status bar, you will not be able to see important indicators, such as the New Alarms, Hidden Alarms, and Frozen Grid indicators.
6. Click **OK**.

## Automatic Query for Alarms on Start Up

You can configure the Alarm app to automatically query the Alarm Database when the control starts up at run time.

By default, current alarms and recent alarms and events are automatically queried when the Alarm app starts at run time. You can disable the automatic query if the Alarm app is:

- Configured to mainly use query filters
- Controlled mainly by scripts

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### To query the Alarm Database automatically on start up

1. Select the Alarm app placed on a pane.
2. Select the **Properties** grid to show Alarm app properties.
3. Select the ellipsis button shown at the right of the Configuration field to show the Alarm app's **Configuration** dialog box.
4. Click the **Run-Time Behavior** tab. The **Run-Time Behavio**r page appears.
5. Select the **Query on Startup** check box.
6. Click **OK**.

## Scroll Automatically to New Alarms

If an operator views multiple pages of alarms, new alarms may go unnoticed. You can configure the Alarm app to scroll automatically to show new alarms. Use the AutoScroll Boolean property in scripts to scroll automatically to new alarms.

However, if the Alarm app scrolls automatically to new alarms, it may be hard for the operator to view and analyze older alarms if new alarms occur. If the Alarm app is frozen, it will not scroll automatically to new alarms.

### To scroll automatically to new alarms

1. Select the Alarm app placed on a pane.
2. Select the Properties grid to show Alarm app properties.
3. Select the ellipsis button shown at the right of the Configuration field to show the Alarm app's **Configuration** dialog box.
4. Click the **Run-Time Behavior** tab. The **Run-Time Behavior** page appears.
5. Select the **Auto Scroll to New Alarms** check box.
6. Click **OK**.

## Hide Errors, Warnings, and Status Messages

You can prevent a message dialog box from opening when errors, warnings, or status messages occur in the Alarm app. Even if you hide errors, warnings and status messages are sent to the Operations Control Logger.

### To hide error and warning messages

1. Select the Alarm app placed on a pane.
2. Select the **Properties** grid to show Alarm app properties.
3. Select the ellipsis button shown at the right of the Configuration field to show the Alarm app's **Configuration** dialog box.
4. Click the **Run-Time Behavior** tab. The **Run-Time Behavior** page appears.
5. Select the **Hide Errors and Warnings** check box.
6. Click **OK**.

## Restrict User Access to Rows and Columns

You can prevent the operator from:

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- Resizing columns
- Selecting rows
- Selecting multiple rows

Use this feature for interfaces where it is easy to accidentally resize columns or select rows.

### To prevent the operator from resizing columns

1. Select the Alarm app placed on a pane.
2. Select the **Properties** grid to show Alarm app properties.
3. Select the ellipsis button shown at the right of the Configuration field to show the Alarm app's **Configuration** dialog box.
4. Click the **Run-Time Behavior** tab. The **Run-Time Behavior** page appears.
5. Clear the **Allow Column Resizing** check box.
6. Click **OK**.

### To prevent the operator from selecting rows

1. Select the Alarm app placed on a pane.
2. Select the **Properties** grid to show Alarm app properties.
3. Select the ellipsis button shown at the right of the Configuration field to show the Alarm app's **Configuration** dialog box.
4. Click the **Run-Time Behavior** tab. The **Run-Time Behavior** page appears.
5. In the **Row Selection** list, click:
   - **No** to prevent operator from selecting rows
   - **Single** to allow operator to only select one row
   - **Multiple** to allow operator select multiple rows
6. Click **OK**.

## Retain Hiding when Changing Alarm Query Filter

You can configure the Alarm app to hide alarms even if the alarm query filter changes.

### To retain hiding when change the alarm query filter

1. Select the Alarm app placed on a pane.
2. Select the **Properties** grid to show Alarm app properties.
3. Select the ellipsis button shown at the right of the Configuration field to show the Alarm app's **Configuration** dialog box.
4. Click the **Run-Time Behavior** tab. The **Run-Time Behavior** page appears.
5. Select the **Retain Hidden** check box.
6. Click **OK**.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Override a Frozen Grid

You can configure the Alarm app to unfreeze the grid after a given time in seconds. Use this option to make sure that new alarms appear on the grid after a specified time.

The Alarm app also unfreezes if you change one of the following:

- Alarm Mode
- Alarm Query
- Query Filter

#### To override the frozen grid

1. Select the Alarm app placed on a pane.
2. Select the **Properties** grid to show Alarm app properties.
3. Select the ellipsis button shown at the right of the Configuration field to show the Alarm app's **Configuration** dialog box.
4. Click the **Run-Time Behavior** tab. The **Run-Time Behavior** page appears.
5. Select the **Auto Resume** after check box and type the number of seconds after which the grid unfreezes.
6. Click **OK**.

### Customize the No Records Message

You can customize the message that appears when there are no records to show in the grid.

#### To customize the "no records" message

1. Select the Alarm app placed on a pane.
2. Select the **Properties** grid to show Alarm app properties.
3. Select the ellipsis button shown at the right of the Configuration field to show the Alarm app's **Configuration** dialog box.
4. Click the **Run-Time Behavior** tab. The **Run-Time Behavior** page appears.
5. Select the **Show Custom 'No Records' Message** check box and type a message you want to show in the Alarm app when there are no alarm records.
6. Click **OK**.

### Configure the Alarm app to Require an ACK Signature

Even if you are logged into the AVEVA OMI ViewApp, acknowledging the alarms that fall within a specific priority range may need to be authenticated by you if required by your company or industry. You can configure the Alarm Control to provide such functionality by selecting the **Requires ACK Signature** check box in the **Object Properties** dialog of the Alarm Control.

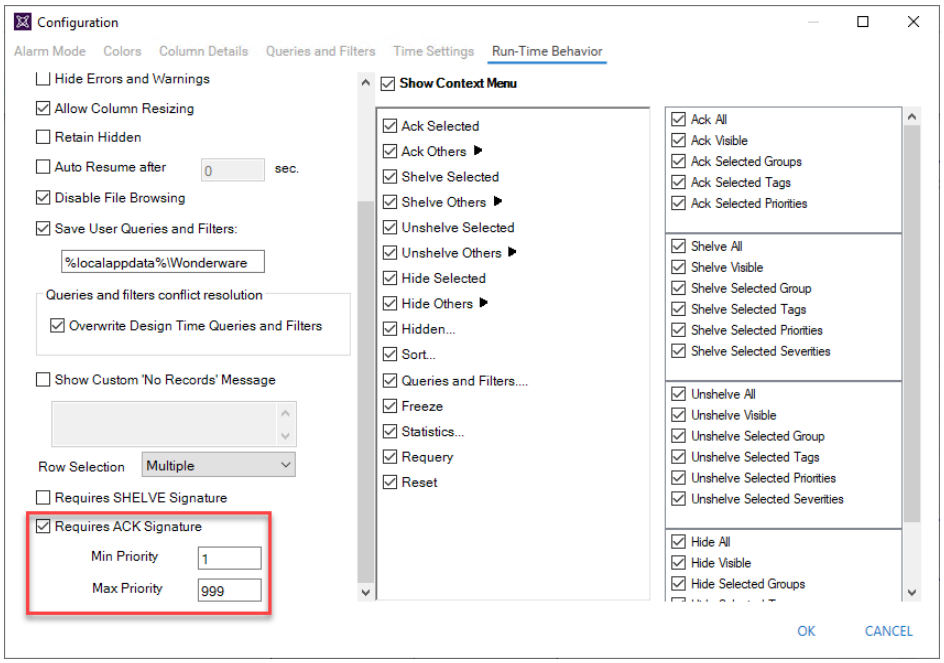
After the Alarm Control has been configured to require a signature for acknowledgement, you need to set its minimum and maximum priority values. The valid range of the minimum and maximum priority values is 1 to 999.

#### To configure the Alarm Control to require ACK signature

1. Select the Alarm Control placed on a pane.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

2. Select the **Properties** grid to show Alarm Control properties.
3. Select the ellipsis button shown at the right of the Configuration field to show the Alarm Control's **Configuration** dialog box.
4. Click the **Run-Time Behavior** tab. The **Run-Time Behavior** page appears.




5. Select the **Requires ACK Signature** check box. (You may need to scroll the left column to make it visible.) The **Min Priority** and **Max Priority** boxes are enabled.
6. Enter the minimum and maximum priority values for the alarm range window that will require authentication.
7. Click **OK**.

You can configure the alarm signature requirement as well as the minimum and maximum values in run time using the Object Editor. For more information about using the Object Editor, see Working with Objects in the Application Server Help.

## Configure the Alarm App to Require a Shelve Signature

Operators can temporarily shelve selected alarms from the list of an Alarm app's active alarms. A shelved alarm is suppressed and removed from the list of active alarms. Typically, operators shelve lower severity nuisance alarms because they provide little diagnostic value and interfere with the operator's ability to manage a plant process.

An alarm is shelved for a specified period. After the period ends, alarms are automatically unshelved and appear again in the list of active alarms. Operators can also manually unshelve an alarm before the end of the specified shelved period.

By default, Medium and Low severity alarms are enabled for shelving. Critical and High severity alarms are not because of the potential risk of shelving and ignoring alarms that represent serious operating states. For more information about enabling shelving based on alarm severity, see Configuring Alarm Historization, Mapping, and Shelving Priority Ranges in the Application Server Help.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

The Alarm app provides a configuration option to restrict alarm shelving only to operators authorized by application security. When an operator selects one or more alarms and attempts to shelve them, the Alarm app verifies if a shelve signature is required.

- If no shelve signature is required

  The Alarm app shows a simple **Shelve Comment** dialog box with a **Duration** field to select the number of hours (1, 2, 4, 8, 12) to shelve the alarm and a **Reason** field to enter a mandatory comment.

- if a shelve signature is required and application security is active

  The Alarm app shows a Shelve Comment dialog box with fields for the operator to enter user credentials (name, password, domain) in addition to selecting a shelve duration and entering a mandatory comment.

  By default, the logged-in user appears in the Username field. If the application security type is ArchestrA, then ArchestrA appears in the Domain field and cannot be edited. If the credentials are valid, the Alarm app attempts to shelve the selected alarms.

  The Alarm app shows an error message if the operator enters invalid credentials. When the operator clicks OK on the error message, the Shelve Comment dialog appears again with the entered user name, comment, and duration. The Password (or PIN) is blank. The operator can attempt to authenticate again or cancel.

### To configure the Alarm app to require a SHELVE signature

1. Select the Alarm app placed on a pane.
2. Select the **Properties** grid to show Alarm app properties.
3. Select the ellipsis button shown at the right of the Configuration field to show the Alarm app's **Configuration** dialog box.
4. Select or clear **Requires SHELVE Signature** based on whether operators need to enter their credentials to shelve alarms or not.
5. Click **OK**.

## Configure the Run-Time Shortcut Menu

You can configure the Alarm app’s shortcut menu to show only selected options at run time. The shortcut menus showing historical alarms (or events) and current alarms (or recent alarms and events) are different.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




For the current alarms Context menu, you can also show or hide entire shortcut submenus.

### To hide the Context menu

1. Select the Alarm app placed on a pane.
2. Select the **Properties** grid to show Alarm app properties.
3. Select the ellipsis button shown at the right of the Configuration field to show the Alarm app's **Configuration** dialog box.
4. Click **Run-Time Behavior.** The **Run-Time Behavior** page appears.
5. Clear the **Show Context Menu** check box.
6. Click **OK**.

### To show or hide Context menu options

1. Select the Alarm app placed on a pane.
2. Select the **Properties** grid to show Alarm app properties.
3. Select the ellipsis button shown at the right of the Configuration field to show the Alarm app's **Configuration** dialog box.
4. Click **Run-Time Behavior.** The **Run-Time Behavior** page appears.
    a. Select the options you want to appear on the run-time Context menu (if applicable for the selected client mode).
    b. Clear the options you want to hide from the operator on the run-time Context menu.
5. Click **OK**.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Use the Alarm App at Run Time

During run time, users can right-click on the Alarm app to show a shortcut menu containing commands to monitor and manage alarms. Also, other shortcut options enable users to sort and filter alarms shown by the Alarm app.




**Note**: Many of the commands shown in the shortcut menu can be shown on the command bar as large icons that can be easily selected on touch screen devices. For more information about integrating a command bar in an Alarm app, see Show Command Bar Property.

## Refresh the Alarm Control Grid

You can refresh the Alarm app grid at run time. The Alarm app retrieves alarm record data based on the Alarm Database time range settings.

**To refresh the Alarm app**

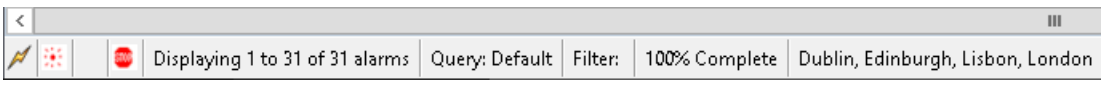
1. Right-click the Alarm app grid at run time. The shortcut menu appears.
2. Click **Requery**.

## View Status Bar Information

The status bar shows you information about the current Alarm app grid. Depending on the current Alarm app mode (real time, historical), the status bar information shows different information.

### View Status Bar Information of Current Modes

If the Alarm app is showing current alarms or recent alarms and events, the status bar shows the following:




| Element | Icon(s) | Description |
|---|---|---|

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

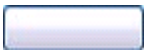
| | | |
|---|---|---|
| Client Mode |  | Indicates the Alarm app is showing the current alarms (or recent alarms and events). |
| New Alarms |  | Appears if new alarms have occurred. If you move the pointer over the indicator, the tooltip shows how many alarms are unacknowledged. |
| Hidden Alarms |  | Appears if any alarms are currently hidden. If you move the pointer over the indicator, the tooltip shows how many alarms are hidden. |
| Frozen Grid |  | Appears if the Alarm app is currently frozen |
| Alarm Records | | Shows the total number of alarm records and which alarms are currently shown. |
| Query Filter | | Shows the name of the current query filter favorite. |
| Retrieval | | Shows the percentage of alarms retrieved from all alarm providers.<br>If this percentage is less than 100%, not all alarm providers are providing alarm data. Use the Alarm Statistics dialog box to detect which alarm providers are not providing alarm data. |
| Time Zone | | Shows the current time zone of the Alarm app. Move the pointer over the time zone to show the full information in a tool tip. |

### View Status Bar Information of Historical Modes

If the Alarm app shows historical alarms or events, the status bar shows the following fields:

| **Element** | **Description** |
|---|---|
| Client Mode |  <br>Indicates the Alarm app is showing historical alarms and/or events. |
| Alarm Records | Displaying 1 to 13 of 28 alarms<br>Shows the total number of alarm records and the number of alarms shown by the Alarm app. |
| Alarm Database | localhost - WWAlmDb<br>Shows the name of the server hosting the Alarm Database and the Alarm Database name. |
| Connection Status | Connected<br>Shows the connection status to the Alarm Database. |
| Time Zone | Beijing, Hong Kong, Uramqi<br>Shows the current time zone of the Alarm app. Move the pointer over the time zone to show complete time zone information in a tool tip. |

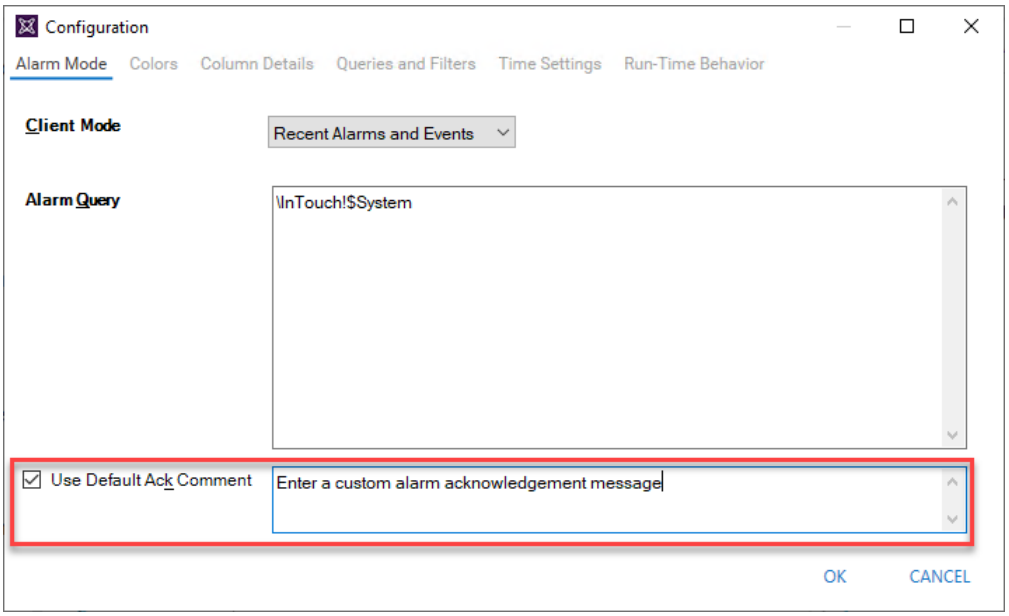
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| Requery |  <br>Click this button to retrieve latest alarm records from the Alarm Database. |

## Acknowledge Alarms

You can configure the Alarm app to require an alarm to be acknowledged even if the condition causing the alarm has passed. This ensures that an operator is aware of events that caused a temporary alarm state, but have returned to normal. You acknowledge alarms at run time using a shortcut menu or by script methods.

You can also configure a comment in the **Configuration** dialog box to use when alarms are acknowledged at run time. Select the **Use Default Ack Comment** check box to enable a default comment, and enter the comment string in the text box to automatically send the acknowledgement comment when a user acknowledges an alarm at run time. The default acknowledgement comment cannot be enabled from the **Properties** tab.




When **Use Default Ack Comment** is disabled, the **Ack Comment** popup is always displayed when a user acknowledges an alarm. You can configure the Ack Comment to automatically fill in the attribute description as the comment by enabling the **Use Description as Comment** Run-Time Behavior property in the **Properties** tab.

You can acknowledge alarm records directly from the Alarm app. You can acknowledge:

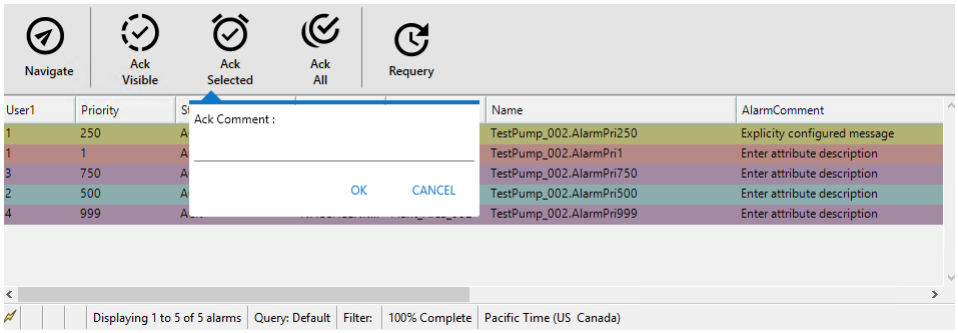
- One or more selected alarms
- All alarms, including alarms not visible due to the limited space of the Alarm app
- All visible alarms
- All alarms with common values, such as provider names, group names, priority ranges, and tag names.

**To acknowledge selected alarms using the Alarm app grid**

1. Select one or more alarms in alarm state.
2. Right-click on an alarm shown in the Alarm app and click **Ack Selected**.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

If no default acknowledgement statement is configured for the Alarm app, the **Ack Comment** popup appears.




Note: If the the **Use Description as Comment** property is enabled, the **Ack Comment** popup will contain the message, "Leave blank to use Attribute Description as Ack Comment."

3. Type an alarm acknowledgement comment and click **OK**.

**To acknowledge other alarms using the Alarm app grid**

1. Select one or more alarms in alarm state.
2. Right-click the Alarm app grid, point to **Ack Others**, and click one of the following:
   - **Ack All** to acknowledge all alarms in alarm state Ack Visible to acknowledge all visible alarms
   - **Ack Selected Group** to acknowledge alarms with the same provider names and group names of one or more selected alarms in alarm state.
   - **Ack Selected Tag** to acknowledge alarms with the same provider names, group names, and tag names within the priority ranges of one or more selected alarms in alarm state.
   - **Ack Selected Priority** to acknowledge alarms with the same provider names, group names, and within the priority ranges of one or more selected alarms in alarm state.
3. If no default acknowledgement statement is configured for the Alarm app, the **Ack Comment** popup appears.
4. Type an alarm acknowledgement comment and click **OK**.

## Provide a Signature to Acknowledge Alarms

You must provide your signature in the **Ack Alarms** dialog box to acknowledge alarms. A signature is required when the **Require ACK Signature** check box is selected and any of the selected alarms falls within the configured priority range, or if no one is logged on to the ViewApp. You are not required to be logged on to the ViewApp to acknowledge alarms. However, if you are logged on, the **Username** box displays the username.

When you select the **Require ACK Signature c**heck box, the acknowledgment comment is prefixed in the updated Alarm Record. If one or more of the selected alarms falls within the configured priority range, the comment is prefixed with "Signed ACK -" indicating that it is a signed acknowledgment. Otherwise, it is prefixed with "Std ACK -" indicating that it is a standard acknowledgment.

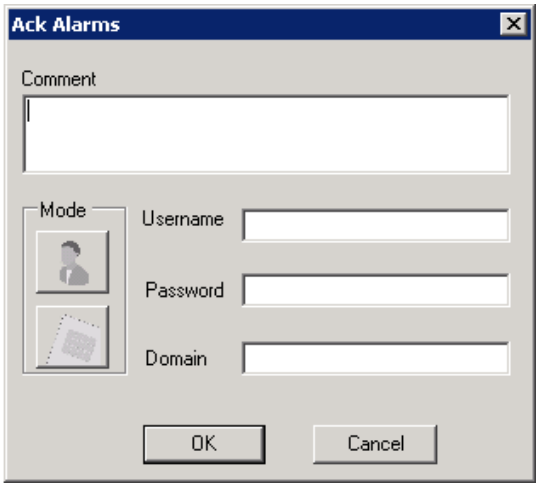
**Note**: If the selected alarms do not require a signature, then the **Ack Alarms** dialog box displays the **Comment** box. You can enter a comment before acknowledging the alarm.

**To provide a signature to acknowledge alarms with user name**

1. Select one or more alarms in the alarm state.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

2. Right-click the Alarm app grid and click Ack Selected.
3. If the selected alarms require a signature, or if you are not logged on to InTouch, then the **Ack Alarms** dialog box appears. If the Smart Card authentication system is not configured on your computer, the following dialog appears:




4. In the **Comment** box, enter or modify the alarm comment.
5. In the **Username** box, enter your user name.
6. In the **Password** box, enter your password.
7. In the **Domain** box, enter the domain and click **OK**.

**Note**: If you enter invalid credentials, the Alarm app displays an error message. When you click **OK**, the **ACK Alarms** dialog box appears again with the user name and the comment you had provided. You must enter the correct password.

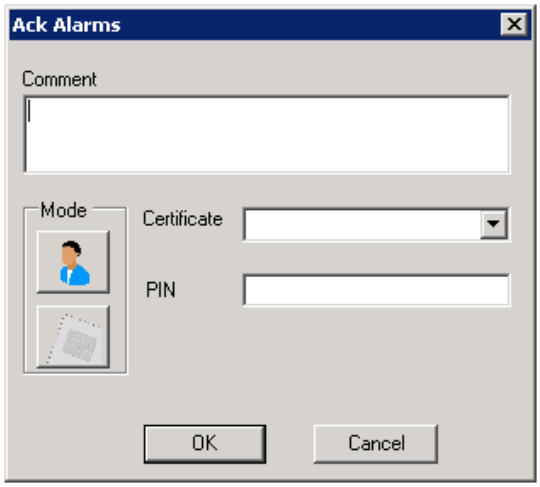
## Acknowledge Alarms Using Smart Cards

You can use a Smart Card to provide the authentication to acknowledge alarms if your computer supports Smart Card authentication. In that case, the Alarm app displays the Ack Alarms dialog box with the Smart Card authentication dialog. You must have the Smart Card inserted in the Smart Card reader attached to your computer.

**To provide a signature to acknowledge alarms using Smart Cards**

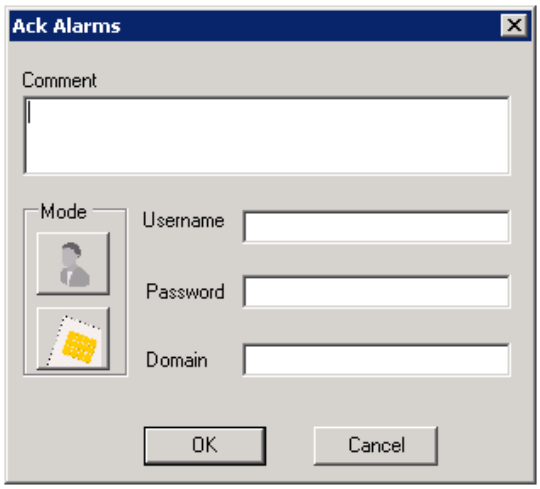
1. Select one or more alarms in an alarm state.
2. Right-click the Alarm app grid and click **Ack Selected**.
3. If the selected alarms are configured to require a signature and if Smart Card Authentication is selected in InTouch, the **Ack Alarms** dialog box appears where the Smart Card button under **Mode** is disabled.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




4. In the **Comment** box, enter or modify the comment.
5. From the Certificate list, select the Smart Card currently inserted into the reader in your system.

   **Note**: If a card is newly-inserted or removed from the reader, you can update the list of cards by selecting the appropriate Smart Card from the Certificate list.
6. In the **PIN** box, enter the personal identification number and click **OK**.
   a. If you enter an invalid PIN, the system displays an error message. When you click **OK**, the ACK Alarms dialog box appears again with the user credential and the comment you had provided. You must enter the correct PIN.
   b. If you need to provide your log on credentials instead of the Smart Card details to verify your signature, click the **User Name Authentication** button under **Mode**. A different version of the **Ack Alarms** dialog box appears where the Smart Card button under **Mode** is enabled.




## Dismissing Alarms at Run Time

When an alarm occurs, the run time operator (or system) can acknowledge the alarm to indicate that they are aware of the alarm. An acknowledged alarm that has returned to a normal value will continue to be displayed if the latching feature has been enabled for the Galaxy. With latching enabled, an acknowledged alarm that has returned to normal condition will be placed in the LATCHED alarm state.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

LATCHED alarms can be displayed in the current alarms mode to show that the alarms did occur. Alarms go to the LATCHED state if:

- You ACK an alarm from UNACK_RTN state.

  Or

- You return an alarm from ACK state.

To view the LATCHED state, you have to enable the LATCHED state under the global settings. For more information, see the topic.

You can dismiss the LATCHED alarms to remove the LATCHED alarms from the current mode of the Alarm Client Control grid. The dismissed LATCHED alarms would be visible in the recent mode of the Alarm Client Control.

**To dismiss selected alarms**

1. Select one or more alarms in **LATCHED** state.
2. Right-click anywhere on the grid and click **Dismiss Selected**.

The selected alarm is removed from the grid.

**To dismiss other alarms**

1. Select one or more alarms in **LATCHED** state.
2. Right-click anywhere on the grid, point to **Dismiss Others**, and click one of the following options:
   - **Dismiss All** to dismiss all alarms in alarm state
   - **Dismiss Visible** to dismiss all visible alarms
   - **Dismiss Selected Groups** Groups to dismiss alarms with the same provider names and group names of one or more selected active alarms
   - **Dismiss Selected Tags** to dismiss alarms with the same provider names, group names, and tag names of one or more selected active alarms

The relevant alarms are removed from the grid.

## Shelve and Unshelve Alarms at Run Time

Operators can shelve alarms to temporarily suppress them for a fixed period. Shelving an alarm means temporarily removing it from the Alarm app's main alarm list and placing it on a shelved list. Shelving is normally controlled by an operator to handle irrelevant nuisance alarms that have not been caught by filtering or alarm suppression mechanisms.

When shelving an alarm from the Alarm app, operators set an associated time period in which the alarm remains shelved and enter a mandatory comment. Operators can select from a list of Alarm app Context commands during run time to:

- Shelve one or more selected alarms
- Shelve all alarms
- Shelve only those alarms visible in the Alarm app
- Shelve all alarms within the same alarm group as an alarm selected from the Alarm app
- Shelve alarms by selected tags or attributes

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- Shelve alarms by selected alarm priorities
- Shelve all alarms that have the same severity as an alarm selected from the Alarm app

When application security is used, alarms can be shelved and unshelved only by operators with proper authorization. For more information about setting shelving authorization, see Configure the Alarm App to Require a Shelve Signature

Shelved alarms are automatically unshelved at the end of the specified time period.Operators can also manually unshelve alarms and return them to an active state. Alarms are unshelved automatically at the end of the shelving time period. An unshelved alarm reappears in the Alarm app active list and resumes its state at the time it was shelved. Operators can manually unshelve a shelved alarm before the end of the shelved period and enter an optional comment.

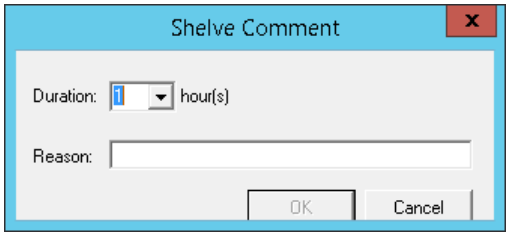
## Shelving Alarms

You can shelve alarms directly from the Alarm app by selecting commands from the Controls menu of the Alarm app.

### To shelve selected alarms using the Alarm app

1. Select one or more alarms in alarm state.
2. Right-click the Alarm app grid and click **Shelve Selected** from the shortcut menu.

   The **Shelve Comment** dialog box appears to set a shelf duration and enter a comment.




3. Select an alarm shelving duration from the **Duration** field.

### To shelve other alarms using the Alarm app

1. Select one or more alarms in alarm state.
2. Right-click the Alarm app, point to **Shelve Others**, and click one of the following shortcut commands:
   - **Shelve All** to shelve all alarms in alarm state
   - **Shelve Visible** to shelve all visible alarms
   - **Shelve Selected Groups** to shelve alarms with the same provider names and group names of one or more selected active alarms
   - **Shelve Selected Tags** to shelve alarms with the same provider names, group names, and tag names of one or more selected active alarms
   - **Shelve Selected Priorities** to shelve alarms with the same provider names, group names, and within the same priority ranges of one or more selected active alarms
   - **Shelve Selected Severities** to shelve alarms with the same provider names, group names, and within the same severity ranges of one or more selected active alarms

   The **Shelve Comment** dialog box appears with fields to set a shelf duration and enter a comment.

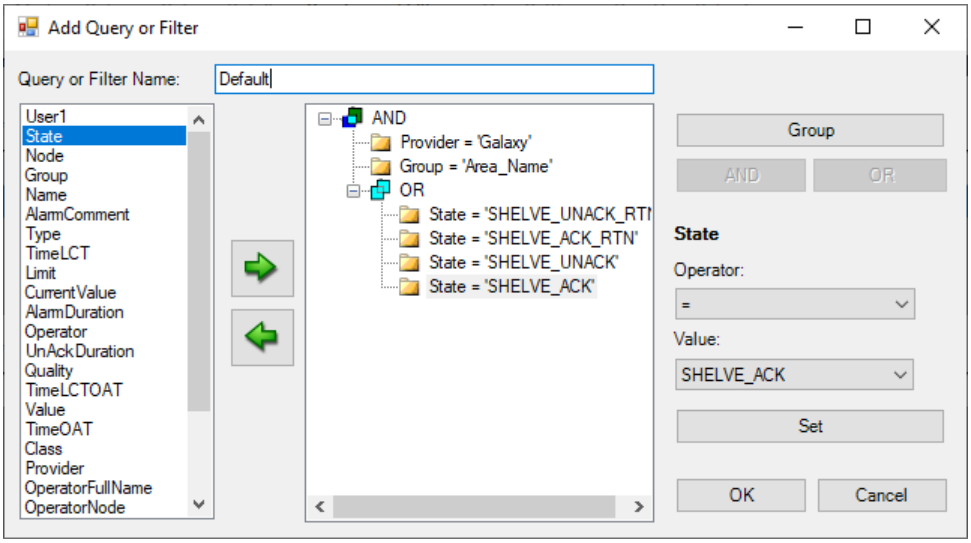
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

3. Select an alarm shelving duration from the **Duration** field.
4. Type a mandatory alarm shelving comment in the **Reason** field and click **OK.**

### Show Shelved Alarms

After alarms are shelved, they no longer appear as active alarms in the Alarm app. The default query of the Alarm app does not show shelved alarms. You must configure an Alarm app query filter similar to the following example to show shelved alarms.

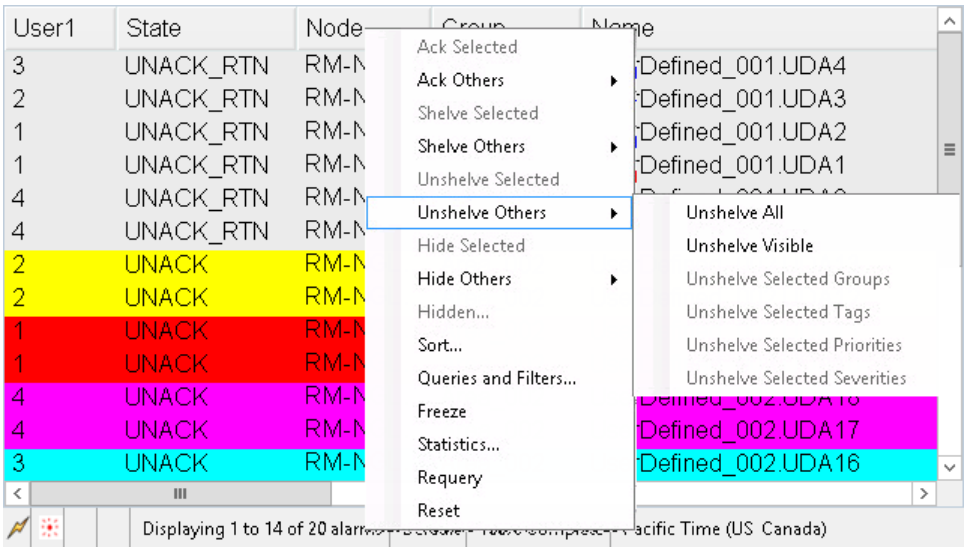
(Provider = 'Galaxy' AND Group = 'Area_Name' AND (State = 'SHELVE ACK RTN' OR State = 'SHELVE_UNACK' OR State = 'SHELVE UNACK RTN' OR State = 'SHELVE ACK'))"




For more information about configuring queries to filter alarms, see Filter Alarms.

## Unshelve Alarms

Manually unshelving alarms follows a similar sequence of steps to shelve alarms using Context menu commands. You should have created a query that shows the current shelved alarms.

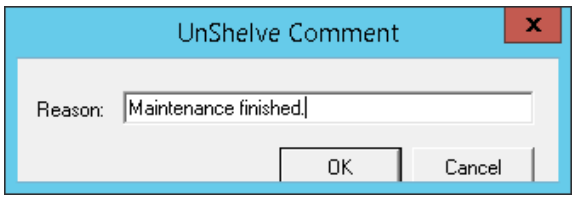



© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### To unshelve selected alarms using the Alarm app

1. Select one or more shelved alarms.
2. Right-click the Alarm app grid and click **Unshelve Selected** from the Context menu.

   The **Unshelve Comment** dialog box appears.




3. Type an optional alarm unshelving comment in the **Reason** field and click **OK**.

### To unshelve other alarms using the Alarm app

1. Select one or more alarms in alarm state.
2. Right-click the Alarm app, point to **Unshelve Others**, and click one of the following shortcut commands:
   - **Unshelve All** to unshelve all shelved alarms
   - **Unshelve Visible** to unshelve all visible shelved alarms
   - **Unshelve Selected Groups** to unshelve alarms with the same provider names and group names of one or more selected shelved alarms
   - **Unshelve Selected Tags** to unshelve alarms with the same provider names, group names, and tag names of one or more selected shelved alarms
   - **Unshelve Selected Priorities** to unshelve alarms with the same provider names, group names, and within the same priority ranges of one or more selected shelved alarms
   - **Unshelve Selected Severities** to unshelve alarms with the same provider names, group names, and within the same severity ranges of one or more selected shelved alarms

   The **Unshelve Comment** dialog box appears.
3. Type an optional alarm unshelving comment in the **Reason** field and click **OK**.

## Sort Alarms During Run Time

The Alarm app supports alarm sorting for up to three columns at design time and run time. At run time, operators can configure sorting of even more columns by clicking on the column headers of the Alarm ControlAlarm app. You can sort alarms in ascending or descending direction for selected columns.

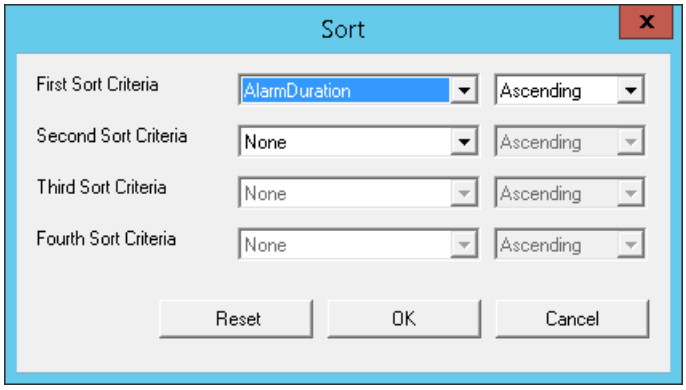
You can sort alarms at run time in similar way as design time. Any changes you make to the sorting at run time are lost when you switch back to design time.

**Note**: If you are sorting by the Value column, the items in the column are sorted alphabetically, not numerically. This is because the Value column can contain strings.

### To set sorting columns and directions with lists at run time

1. Right-click the Alarm app grid and click Sort. The Sort dialog box appears.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




2. Optionally, select the second sort column in the **Second Sort Criteria** list and a sorting direction in the list to its right.
3. If you set the **Second Sort Criteria**, optionally select the third sort column in the **Third Sort Criteria** list and a sorting direction in the list to its right.
4. Click **OK**.

### To set sorting columns and directions in the grid at run time

1. In the Alarm app grid, click on a column header to set sorting for the column. An arrow appears on the column header.
2. To change the sorting direction, click on the column header again. The arrow changes direction on the header.

   **Note**: If you click on a column header after releasing the Shift key, all sorting information is lost and the selected column is the new primary sorting criteria.
3. To set sorting for second and third columns, repeat step 3 while pressing the Shift key.
4. Release the Shift key.

## Filter Alarms at Run Time

You can filter alarms at run time by using the filters you defined at design time.

If you did not define a filter according to your needs at design time, you can still create new filters at run time, or modify existing filters.

If you saved filters to an XML file, you can load them from a file at run-time.

Filters you define at run-time are not saved for use at design-time. To re-use filters you create or modify at run-time, export the filter list to an XML file, and import the XML file at design-time.

If you are showing historical alarms or events, you can use the filtering mechanism provided by the grid technology instead of using filter favorites.

### Use an Existing Query

At run time, you can use any filter you defined at design time, regardless if you defined it for the current modes or historical modes.

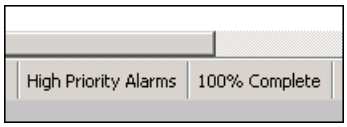
### To use an existing query filter

1. Right-click the Alarm app grid and click **Query Filters**. The **Query Filters** dialog box appears.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

2. Select the filter from the list and click **OK**.

   The alarm records are filtered and the current filter name appears in the status bar.




## Add a New Query or Filter at Run Time

At run time, you can create new queries or filters to limit the number of alarm records.

New queries or filters are saved and can be reused for future sessions.Upon close and restart of the Alarm app window, added queries or filters will be available. For details see Save Run-Time Modifications to Queries and Filters.

### To add a new query or filter at run time

1. Right-click the Alarm app grid and click **Queries and Filters**. The **Queries and Filters** dialog box appears.

   The configuration is the same as in design time. For more information, see Add a New Query Filter.

## Modify an Existing Query Filter

At run time, you can modify a query filter. The modification of query filters is not saved for future use and is only valid for the current session. If you want to save the modifications, you must also export the query filters to an XML file.

### To modify an existing query filter

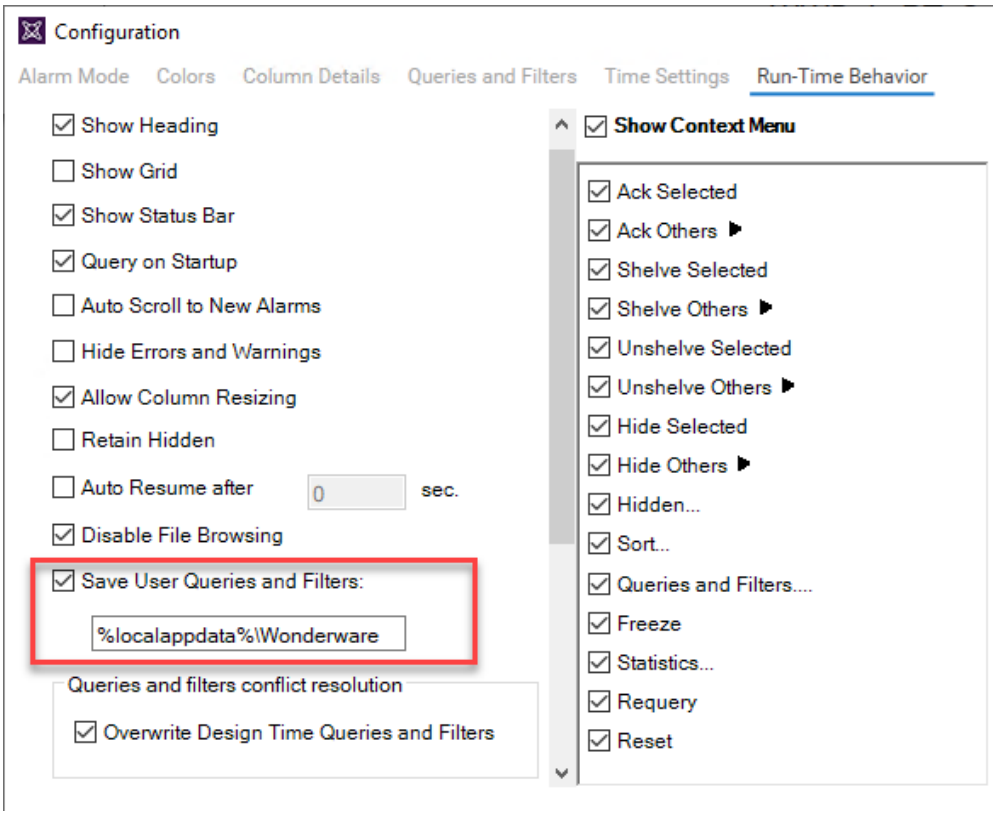
1. Right-click the Alarm app grid and click **Query Filters**. The **Query Filters** dialog box appears.

   The configuration is the same as in design time. For more information, see Modify an Existing Query Filter.

## Save Run-Time Modifications to Queries and Filters

You can save modifications made to queries and filters at run time. There is an option to save user queries and filters in the **Run-Time Behavior** tab of the **Edit Animations** dialog box. It is selected by default, as shown below:

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




When this option is selected, modifications made to queries or filters at run-time are saved on a per user and Alarm app instance to a XML file. For example, a saved query will save as UserQueryFilter_001.xml.

Modifications are saved in the following default directory:

`C:\Users\<OS Login Name>\AppData\Local\Wonderware`

The map between the Alarm app instance and the above XML file is saved in a map file, "InstancesMap.dat".

Modified queries and filters will be available upon closing and restarting the Alarm app window or WindowViewer.

If you uncheck the **Save User Queries and Filters** option, updates made to queries and filters during run-time will not be saved.

---

**Note**: When the **Save User Queries and Filter** option is checked, the **Overwrite Design Time Queries and Filters** option is enabled and checked by default. When checked, this option resolves naming conflicts between design-time queries and filters and run-time queries and filters loaded from the XML file. Naming conflicts will be resolved by overwriting the design time queries and filters.

---

## Delete a Query Filter

At run time, you can delete a query filter.

After you delete a query filter at run time, it is only deleted for the current session. If you want to save the list of query filters without the deleted query filter, you must export the query filters to an XML file. For more information, see .Export Query Filter Favorites.

### To delete an existing query filter

1. Right-click the Alarm app grid and click **Query Filters**. The **Query Filters** dialog box appears.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

2. The configuration is the same as in design time. For more information, see Delete a Query Filter Favorite.

### Import Query Filter Favorites

At run time, you can import the list of query filters from an XML file.

#### To import Query Filter Favorites

1. Right-click the Alarm app grid and click **Query Filters**. The **Query Filters** dialog box appears.

   The configuration is the same as in design time. For more information, see Import Query Filter Favorites.

### Export Query Filter Favorites

At run time, you can export the list of query filters to an XML file for future use. After exporting, you can import the query filter from the XML into design time.

**Note**: The default query filter favorite is not exported to the XML file.

#### To export Query Filter Favorites

1. Right-click the Alarm app grid and click **Query Filters**. The **Query Filters** dialog box appears.

   The configuration is the same as in design time. For more information, see Export Query Filter Favorites.

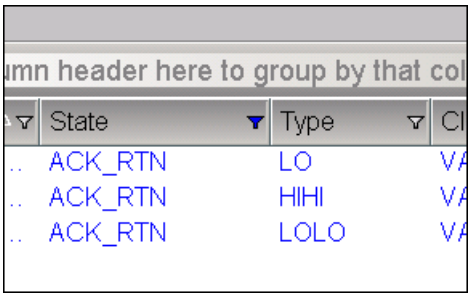
### Filter Alarms with Client-Based Filtering

The grid technology used in the Alarm app enables you to filter the grid contents after the data has been retrieved from the data source.

You can filter historical alarms and/or events in the following ways for any selected column:

| Filter | Description |
|---|---|
| (All) | No filtering. All records are shown for the selected column. |
| (Custom) | Configure a more complex filter for the selected column. For example, a filter that can compare values of different columns. |
| (Blanks) | Filter by blank grid values only. |
| (NonBlanks) | Filter by grid values that show content. |
| Values | Filter by the selected value. |

If a filter is applied to any column in the Alarm app, the filter icon in the column header appears in blue.




#### To filter alarms with client-based filtering

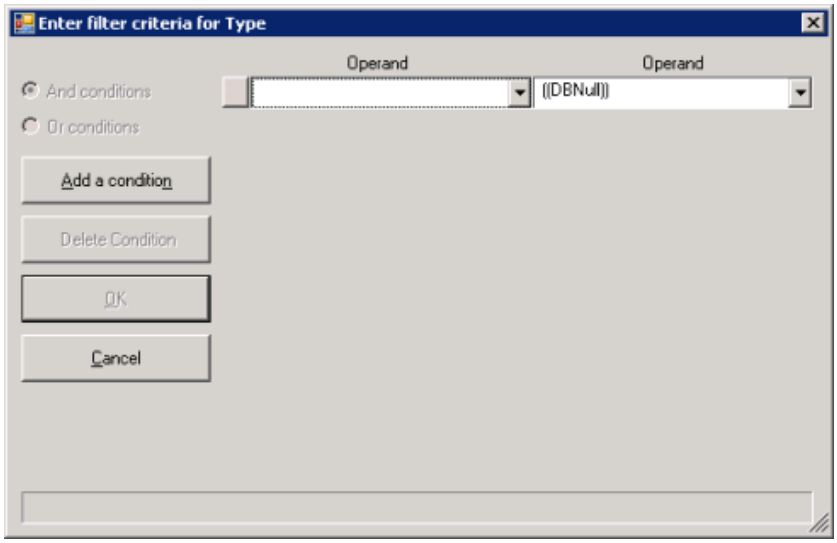
1. Click the filter icon on the column you want to filter by. A menu appears.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

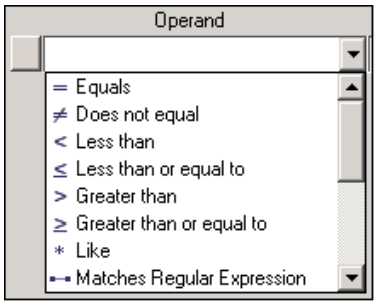



2. Select one of the following:
   - (All) to switch off filtering
   - (Custom) to define a more complex filter
   - (Blanks) to filter by blank values
   - (NonBlanks) to filter by non blank values
   - A value to filter by the value

   If you selected (Custom), a dialog box appears.



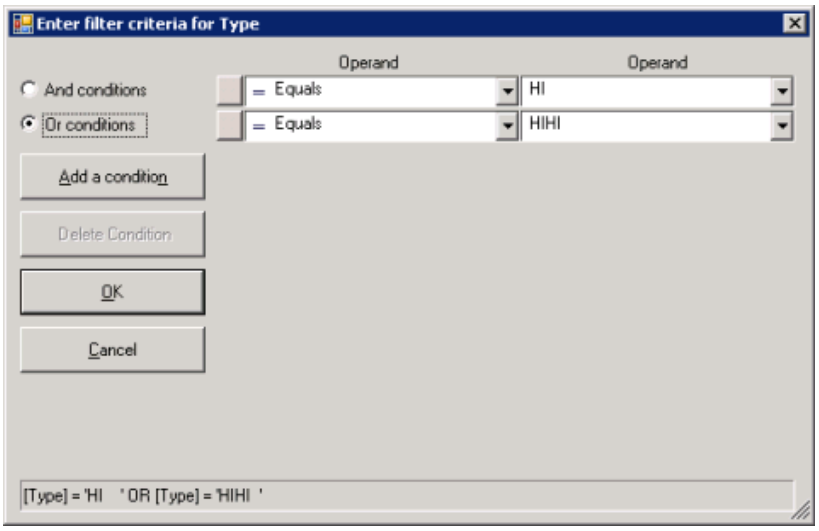

3. Do one of the following:
   - Select a different operator for the current condition




   - Type or select a different operand for the current condition. The operand can be a value or the different value of a different column in the same row.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- Click Add a condition add more conditions to the filter.




- Click Delete Condition to delete one or more selected conditions (You can mark the condition by clicking on the button to the left of each condition.)

4. Click **OK**.

## Reset the Grid

You can reset the Alarm app's column widths, column order, and names to their last design-time values. When you reset the grid, the query filter is also reset to its default.

**To reset the grid**

- Right-click the Alarm app grid and click **Reset**

## Hide Alarms

The "hiding" and "unhiding" of alarm records is known in the Alarm app as "suppressing" and "unsuppressing".

When the Alarm app is hiding alarms, it ignores certain alarms. If an alarm matches the exclusion criteria, it is not visible.

The actual alarm generation is completely unaffected by hiding. Alarm records are still logged into the alarm history.

You can hide:

- All alarms, including alarms not visible due to the limited space of the Alarm app
- All visible alarms
- One or more selected alarms
- All alarms with the same provider names and group names of one or more selected alarms
- All alarms with the same provider names, group names, and within the priority ranges of one or more selected alarms
- All alarms with the same provider names, group names, and tag names within the priority ranges of one or more selected alarms

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

You can also view which alarms are hidden and unhide them.

**To hide all alarms**

- Right-click the Alarm app grid, point to Hide Others, and click **Hide All.**

**To hide all visible alarms**

- Right-click the Alarm app grid, point to **Hide Others**, and click **Hide Visible.**

**To hide selected alarms**

1. Select one or more alarms in alarm state.
2. Right-click the Alarm app grid and click **Hide Selected**.

**To hide alarms with common parameters**

1. Select one or more alarms.
2. Right-click the Alarm app grid, point to **Hide Others**, and click one of the following:
   - Hide Selected Groups to hide alarms with the same provider names and group names of one or more selected alarms
   - Hide Selected Tags to hide alarms with the same provider names, group names, and tag names within the priority ranges of one or more selected alarms
   - Hide Selected Priorities to hide alarms with the same provider names, group names, and within the priority ranges of one or more selected alarms

**To unhide alarms**

1. Right-click the Alarm app grid and click **Hidden**. The **Hidden Alarms** dialog box appears.
2. Select the alarms you want to unhide and click **Unhide**.
3. Click **Close**.

## Freeze and Unfreeze the Alarm App Grid

You can freeze the Alarm app to prevent the Alarm app tree from being updated with any further changes.

For example, if new alarms occur while the Alarm app is frozen, the new alarms are only shown after you unfreeze the Alarm app.

You can configure a time period after which the Alarm app automatically unfreezes to avoid the Alarm app being unknowingly frozen. For example, the operator leaves the workstation and returns without realizing that the Alarm app is still frozen.

The Alarm app unfreezes automatically if one of the following changes:

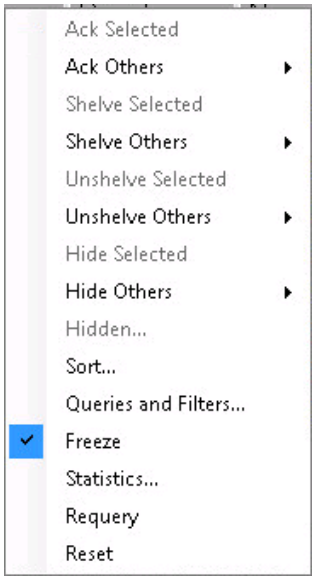
- Alarm Mode
- Alarm Query
- Query Filter

After you unfreeze the Alarm app, the grid updates with the new alarm records and any other updates while the grid was frozen.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

**To freeze or unfreeze the Alarm app grid**

1. Right-click the Alarm app grid. The shortcut menu appears.




   A check mark next to the **Freeze** option indicates if the grid is currently frozen.

2. Click **Freeze**. The Alarm app grid is either frozen or unfrozen.

## Show Alarm Statistics

You can view alarm statistics at run time to see which alarm providers are providing the alarm data.

**To show alarm statistics**

1. Right-click the Alarm app grid and click **Statistics**. The **Alarm Statistics** dialog box appears.

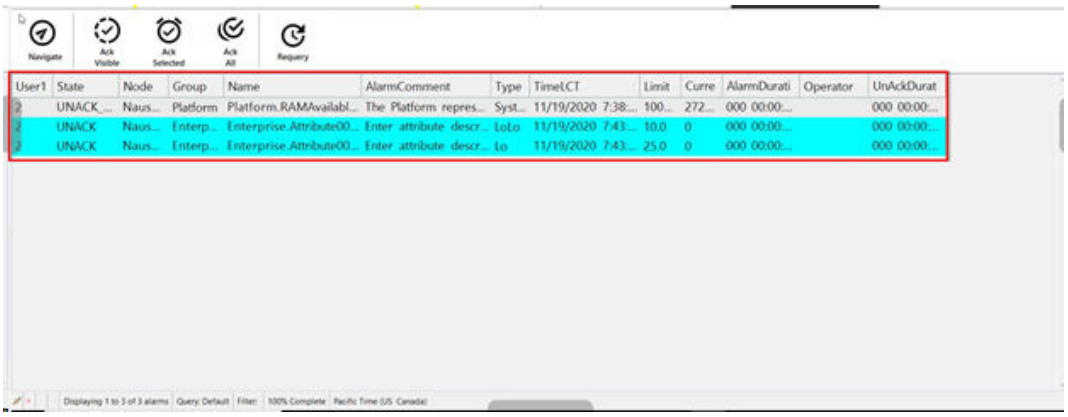
   If you use an Alarm Hotbackup name as alarm query, you can expand the Hotbackup name in the **Alarm Statistics** dialog box to show the individual percentages of retrieval for the configured primary and backup alarm provider.

2. Click **Update** to update the statistics.
3. Click **Close**.

# Set Font Size for the Alarm Grid

The font size for the Alarm grid control in the Alarm App can be set using the FontSize property.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




Typical font sizes for the grid are 18 to 20, and the font size is set by scripting.

```
MyContent.AlarmControl1.FontSize = 18;
```

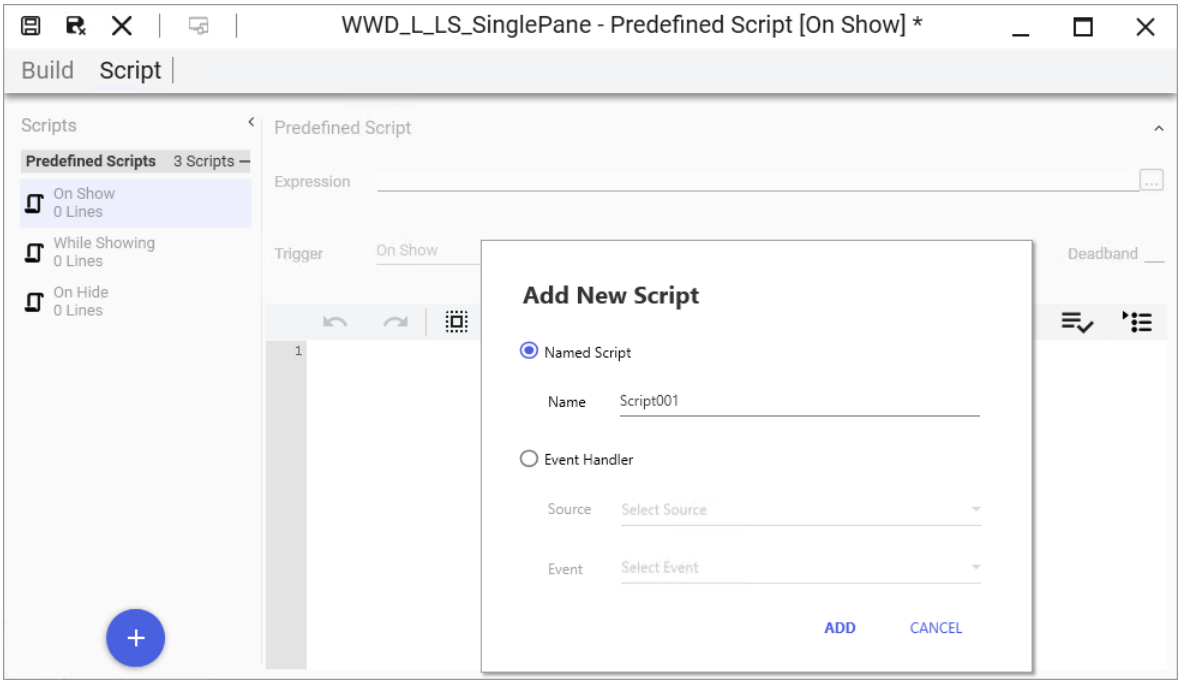
You can also set the font family through scripting, using the FontFamily property.

## AlarmApp Scripts

The AlarmApp can show the underlying .NET Winforms and Windows Presentation Foundation (WPF) control properties, methods, and events in addition to the native properties and methods included with the AlarmApp.

The underlying control properties appear on the Layout editor **Properties** grid after placing the AlarmApp or HistoricalTrendApp onto a layout pane. Because of the large number of underlying control properties, use the Layout editor's search function to find a control property.

AlarmApp methods, many properties (with certain exclusions), and events can be used by the Layout script editor to create named and event handler scripts.




For more information about writing scripts with the Layout editor, see Layout Scripts.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Write a Named Script for the AlarmApp

You write scripts for the from the Layout editor while the Alarm app has been placed onto a layout pane. The Layout script editor supports the MyContent namespace, which is intended for all content items placed on a layout pane that can implement named scripts.

The Layout script editor includes the AutoComplete feature, which shows a positional drop-down list of namespaces, content types, and the methods or public properties associated with AlarmApp content. Although all public properties will appear in the autocomplete list, not all of them can be used in scripts. See

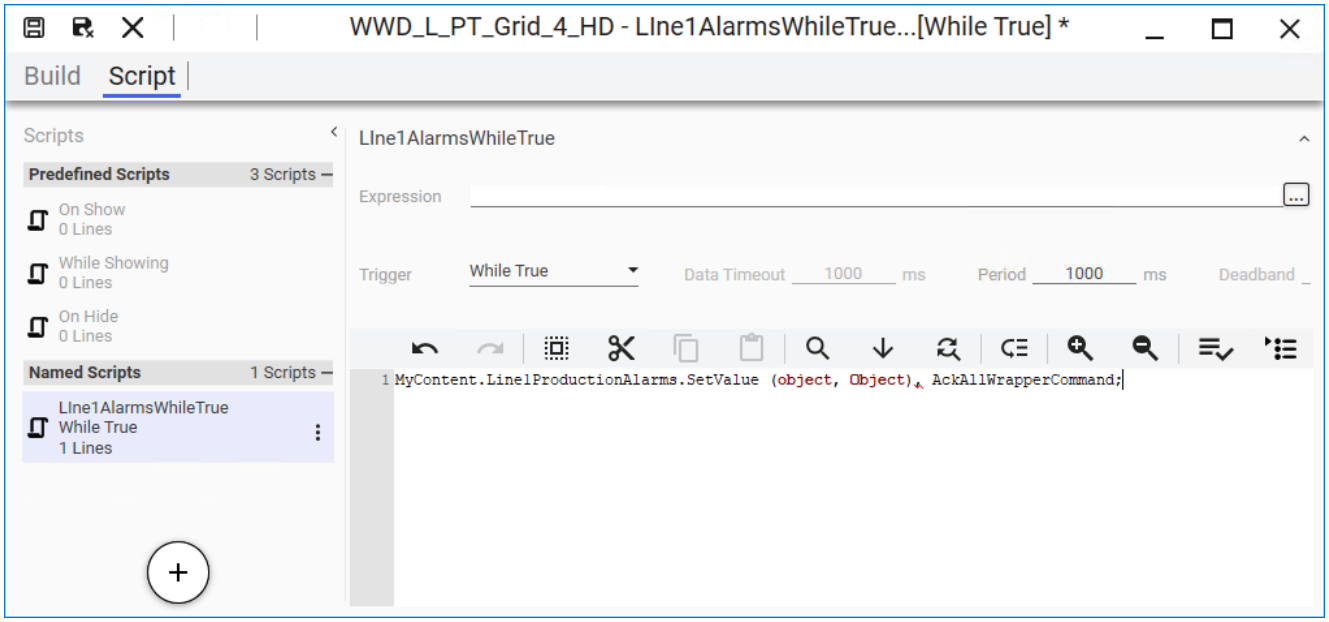
### Write an AlarmApp named or predefined script

1. Open the layout and show the items listed in the **Toolbox** tab.
2. Select the AlarmApp from the **Toolbox** list to show its preview thumbnail.

   The **Toolbox** pathway to the AlarmApp is:

   _Default Content > 4. Apps > AVEVA OMI Apps > AlarmApp
3. Drag and drop the preview thumbnail onto a layout pane.
4. Select **Script** from the menu bar of the Layout editor to open the script editor.
5. Create a Named script.
   a. Select the plus circle to show the **Add NewScript** dialog box.
   b. Select **Named Script**, assign a name to the script, and select **Add** to close the dialog.

   The new script appears beneath the **Named Scripts** area at the left of the editor and the window focus is set to the script edit area to begin writing script code
6. Enter your script code.




A script intended for an AlarmApp placed on a layout pane uses the MyContent namespace and its content name is the name assigned to it from the **Name** property of the Layout editor. Place a period immediately

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

after the item you selected from the AutoComplete list. AutoComplete shows the next positional list of items based on your previous selections in the script statement.

AutoComplete provides a list of properties and methods that can be included in the script based on the MyContent.AlarmControll prefix of the script statement.

- For .NET methods and properties, refer to .NET documentation on the Microsoft web site.
- For descriptions of legacy Alarm app methods and properties, refer to the *Alarm Client Control* help. The document is a PDF file located on the computer hosting the System Platform IDE.

  C:\Program Files (x86)\ArchestrA\Framework\Docs\1033\AlarmClientControl.pdf

7. Validate your script code by selecting the validation button at the right on the menu bar above the script edit area.



8. After making any script corrections, save and exit from the Layout script editor.

### Alarm Client Control Pass-Through Properties

The following Alarm App properties can be used in scripts, but are pass-through properties to the underlying Alarm Control. To maximize performance, we recommend that you set these through the underlying Alarm Client Control property when used in a layout script, using the following syntax:

```
MyContent.AlarmControl1.AlarmClientControl.AlarmQuery
```

- AlarmQuery
- AutoScroll
- ClientMode
- FlashUnAckAlarms
- GroupByHeader
- MaxPriority
- MinPriority
- Required
- ShowContextMenu
- ShowGrid
- ShowHeading
- ShowStatusBar

### Alarm Client Control Property

The AlarmClientControl property lets you explore the underlying methods and events that can be scripted within the underlying Alarm Client Control, using the following syntax:

```
MyContent.AlarmControl1.AlarmClientControl.<PropertyName>
```

**Examples:**

```
MyContent.AlarmControl1.AlarmClientControl.AlarmQuery
MyContent.AlarmControl1.AlarmClientControl.ClientMode
MyContent.AlarmControl1.AlarmClientControl.AckSignature.MaxPriority
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

```
MyContent.AlarmControl1.AlarmClientControl.ShowGroupByHeader
```

### Alarm App Scriptable Properties

The Alarm App by itself contains only a single public property (ShowAreaHierarchy) for use in scripting. All other properties are exposed by the underlying control. Although some of these pass-through properties can be seen in autocomplete, you should use the underlying property to maximize script performance.

The syntax for invoking the built-in Alarm App property is:

```
MyContent.AlarmControl1.ShowAreaHierarchy
```

The syntax for invoking pass-through properties is as follows:

```
MyContent.AlarmControl1.AlarmClientControl.AlarmQuery
```

#### Scriptable Properties

**Note:** Since most scriptable properties in the Alarm App are exposed by the underlying control, this list is very similar to the list of Alarm Client Control pass-though properties listed in the previous section.

- AlarmQuery
- AutoScroll
- ClientMode
- FlashUnAckAlarms
- GroupByHeader
- MaxPriority
- MinPriority
- Required
- ShowAreaHierarchy (built-in)
- ShowContextMenu
- ShowGrid
- ShowHeading
- ShowStatusBar

#### Non-Scriptable Properties

The remainder of the properties exposed by autocomplete in the Script Editor are public, but are not scriptable.

## Write an Event Handler Script

You can write event handler scripts by two methods after placing the AlarmApp onto a layout pane.

- Assigning values to the **Available Events** property on a selected control's **Properties** grid.

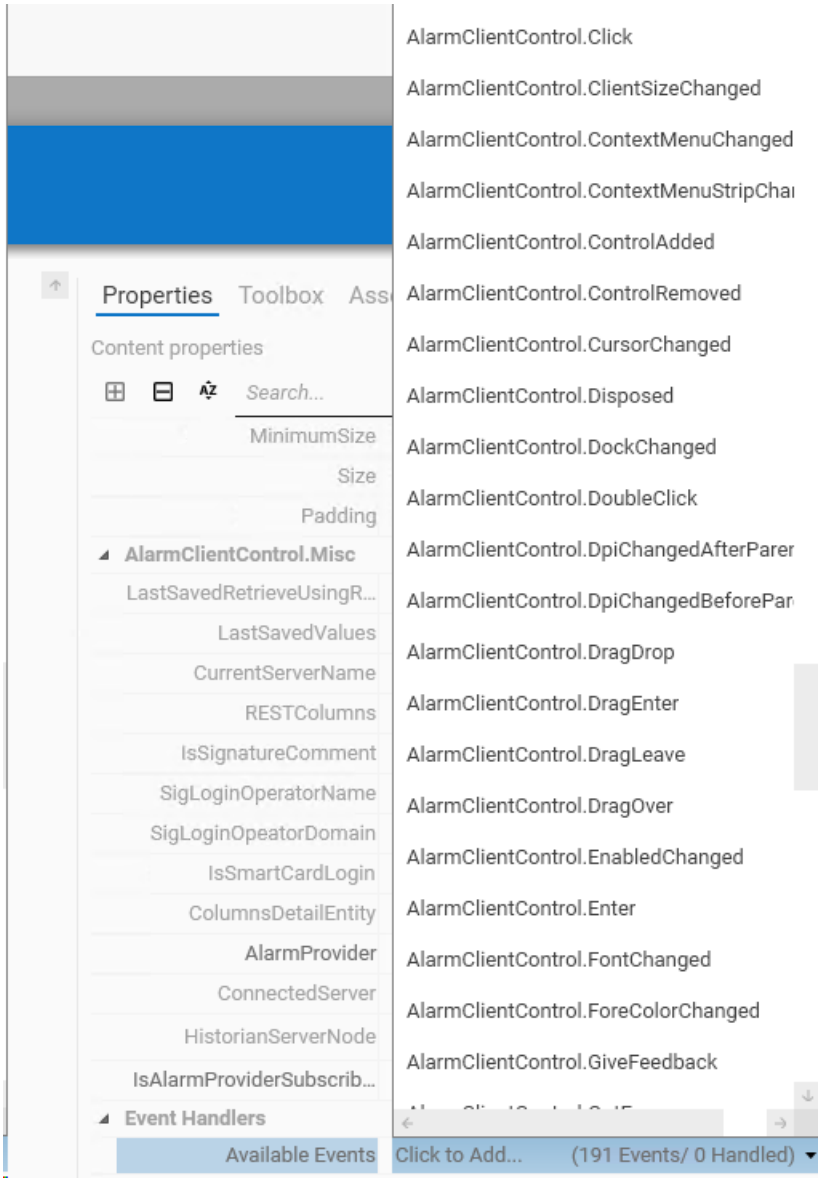
  You select an event from a list of all available events of the control to create an event handler.
- Add a new event handler script from the Layout script editor's **Add New Script** dialog.

The following topics describe the workflows to create an event handler script by these two methods.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Write an Event Handler Script from the Properties Grid

The underlying control of the AlarmApp includes a set of public properties and events that can be viewed from the Layout editor's **Properties** grid.The **Available Events** property near the bottom of the **Properties** list shows a list of AlarmApp events when it is selected. The listed events are prefaced with the name of the underlying control's property, as declared by the app.




After selecting a public AlarmApp event from the list, the Layout script editor opens to write an event handler script.

### Write an Event Handler script using the Available Events property of the AlarmApp

1. Open the Layout editor and show the items listed in the **Toolbox** tab.
2. Select the AlarmApp from the **Toolbox** list to show its preview thumbnail.

   The **Toolbox** pathway to the AlarmApp is:

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

_Default Content > 4. Apps > AVEVA OMI Apps > AlarmApp

The preview thumbnail of the AlarmApp appears beneath the list of **Toolbox** items.

3. Drag and drop the preview thumbnail of the AlarmApp onto a layout pane.
4. Select the pane where the AlarmApp has been placed and select the **Properties** grid.

   AlarmApp properties appear in the grid. AlarmApp events appear in a list of the **Available Events** property.
5. Select the data entry field of the **Available Events** property to show a list of events.

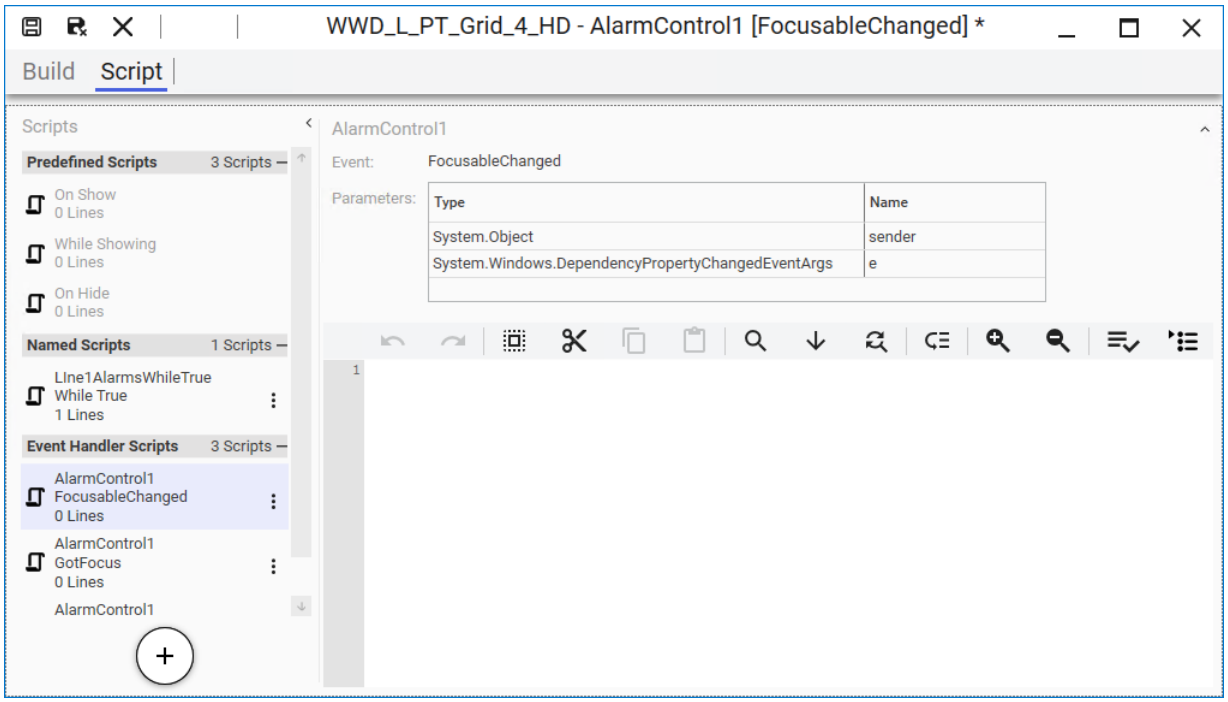
   Events are listed in alphabetic order.
6. Select one or more events from the list.

   A selected handled event name appears in bold text.

   The **Available Events** property updates to show each selected handled event with a data entry field.

   All handled events without any script lines are listed in alphabetic order.
7. Select the button at the right of the selected event's data entry field.

   The Layout script editor opens with the selected handled events listed beneath the **Event Handler Scripts** column. The focus of the Layout script editor will be the event handler you selected from the **Available Events** property.




   The **Event** field shows the selected event script from the list.
8. Enter script code for each event handler.

   The number of lines in each event handler script are shown in the **Available Events** property of the Layout editor.
9. Validate your script code by selecting the validation button at the right on the menu bar above the script edit area.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.



10. Save your scripts and exit from the Layout script editor.

### Write an Event Handler Script from the Layout Script Editor

Event Handler scripts can be created with the **Add New Script** dialog box of the Layout script editor. Handled events can be selected for the **Event** list of the **Add New Script** dialog box.

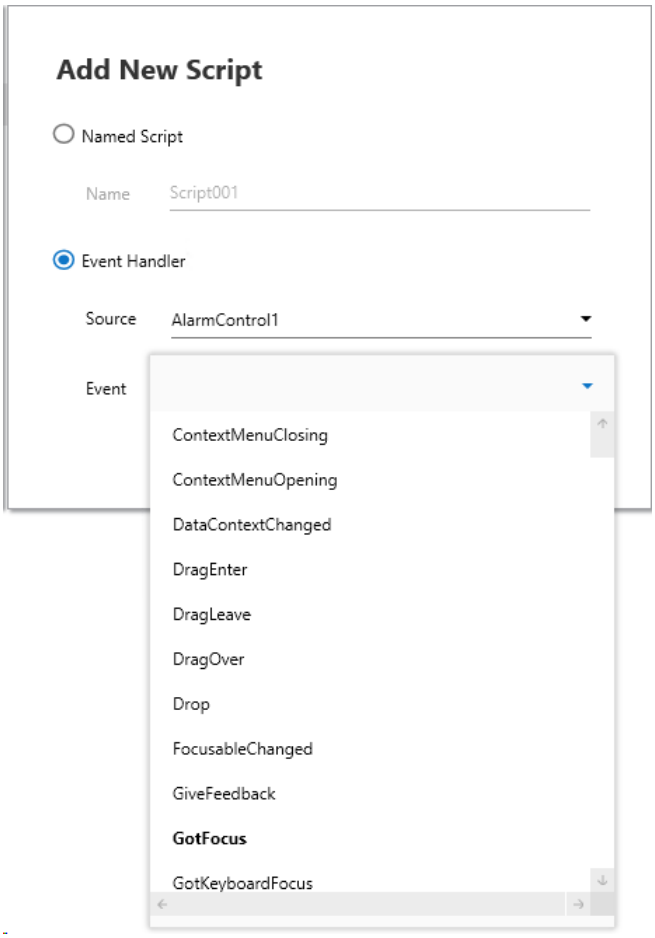
#### Write an AlarmApp event handler script from the control Properties page

1. Open the layout and show the items listed in the **Toolbox** tab.
2. Select the AlarmApp from the **Toolbox** list to show its preview thumbnail.

   The **Toolbox** pathway to the AlarmApp is:

   _Default Content > 4. Apps > AVEVA OMI Apps > AlarmApp
3. Drag and drop the preview thumbnail onto a layout pane.
4. Select **Script** from the menu bar of the Layout editor to open the script editor.
5. Create an event handler script.
   a. Within the Layout script editor, select the red plus circle to show the **Add NewScript** dialog box.
   b. Select **Event Handler**.
   c. Select the name of the AlarmControl placed on the layout pane from the **Source** list.
   d. Select the data field of **Event** to show a list of event handlers.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




e. Select one or more event handlers from the list.

f. Select **Add** to close the **Add New Script** dialog box and return to the Layout script editor.

   The **Event Handler Scripts** area shows the selected event handlers in alphabetic order.

6. Select an event handler from the list and enter script code for each event handler.

   The number of lines in each event handler script are shown in the **Available Events** property of the Layout editor.

7. Validate your script code by selecting the validation button at the right on the menu bar above the script edit area.

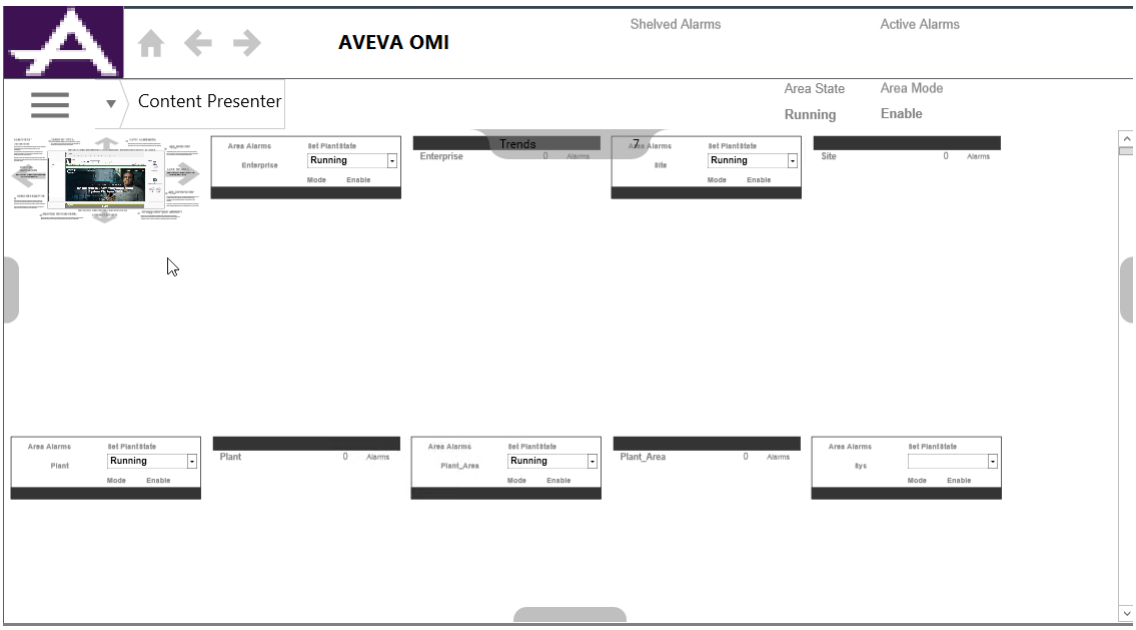
8. Save your scripts and exit from the Layout script editor.

   The new event handler scripts appears beneath the **Event Handler Scripts** area at the left of the editor and the window focus is set to the script edit area to begin writing script code.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Chapter 2 ContentPresenter App

The ContentPresenter app shows graphics from one or more selected nodes of a ViewApp navigation model. The pane in which the ContentPresenter app has been placed shows a set of graphic thumbnails that match the ContentPresenter app filter criteria. Graphics shown by the ContentPresenter app can be filtered by content type, name, and location within the ViewApp navigation model.



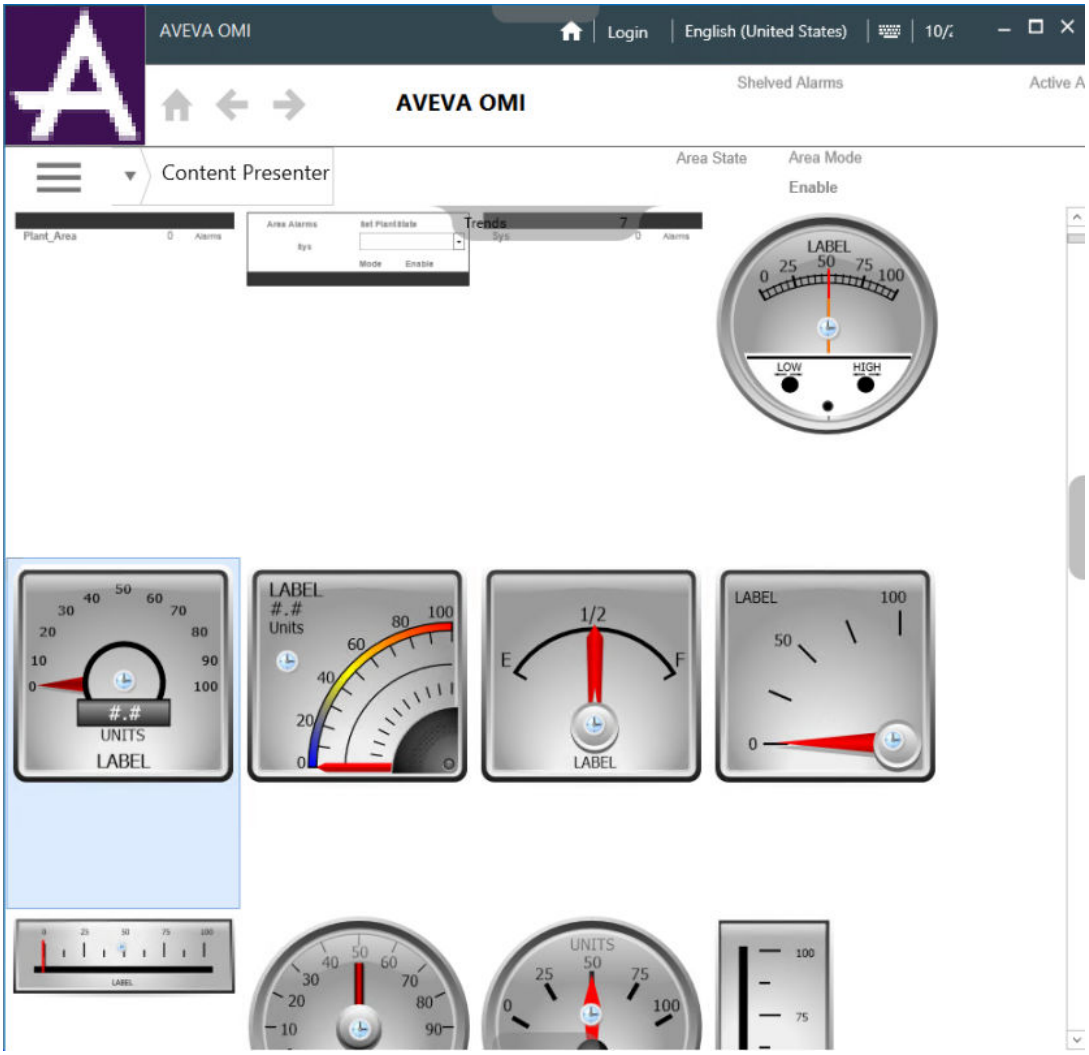

Other ContentPresenter app properties determine the size and layout of the graphic thumbnails. An **Interactive Content** property enables users to interact with the scripts and animation of selected graphic items shown by the ContentPresenter app. Finally, users can selected a graphic shown by the ContentPresenter app to set the current focus of a ViewApp to the navigation item containing the graphic.

### Details of the ContentPresenter app Display

During configuration, a ContentPresenter app is placed in a layout pane. The pane itself becomes the view port of the ContentPresentApp to show the graphics incorporated in the running ViewApp. The following figure shows the display of the ContentPresenter app during runtime. In this example, graphics are listed in horizontal order and wrap to the next row of the view port when a graphic cannot completely fit within the right view port border.

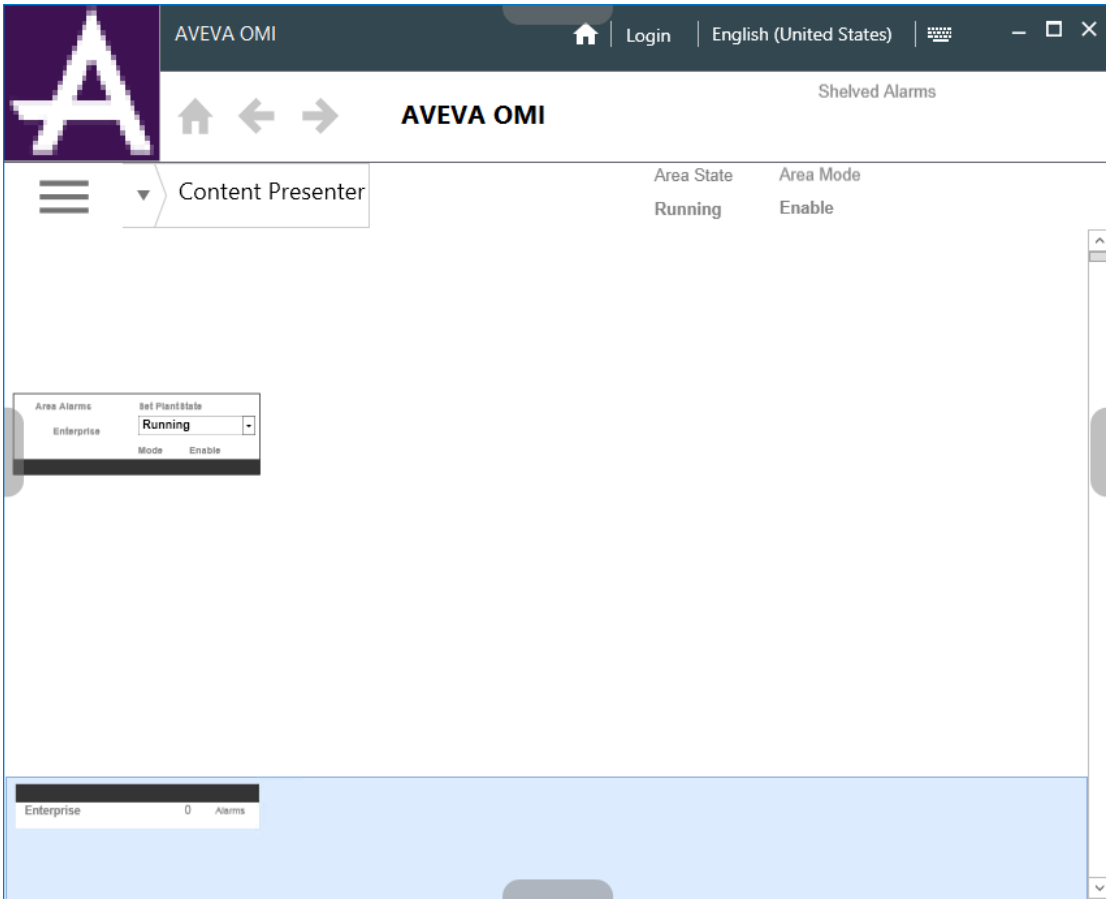
The size of the view port can be changed by adjusting the size of the layout pane to show more or fewer graphics on each row. Graphics continue to wrap to the next row until they extend beyond the bottom of the view port. Scroll bars appear to move the view port vertically and show the remaining graphics.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




This example shows a graphic display when the **Fill** property is set to **Horizontal** and the **View Mode** property is set to **WrapContent**. Both properties include other options to list graphics vertically and show the graphics in continuous sequential order without wrapping.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.



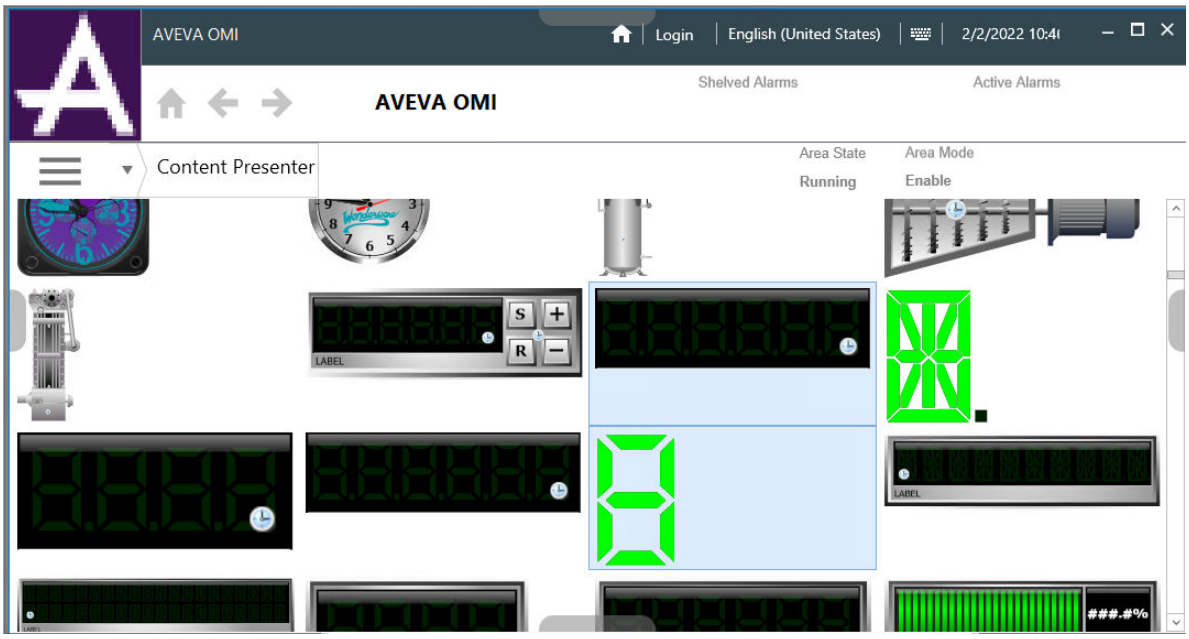

The blue background shown in both examples represents a cell within a view port. Each view port cell contains a single graphic. The ContentPresenter app includes a set of **Layout** and **Size** properties that determine the size of the cell, the blank space around the graphic, and the placement of the graphic within the cell.




© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

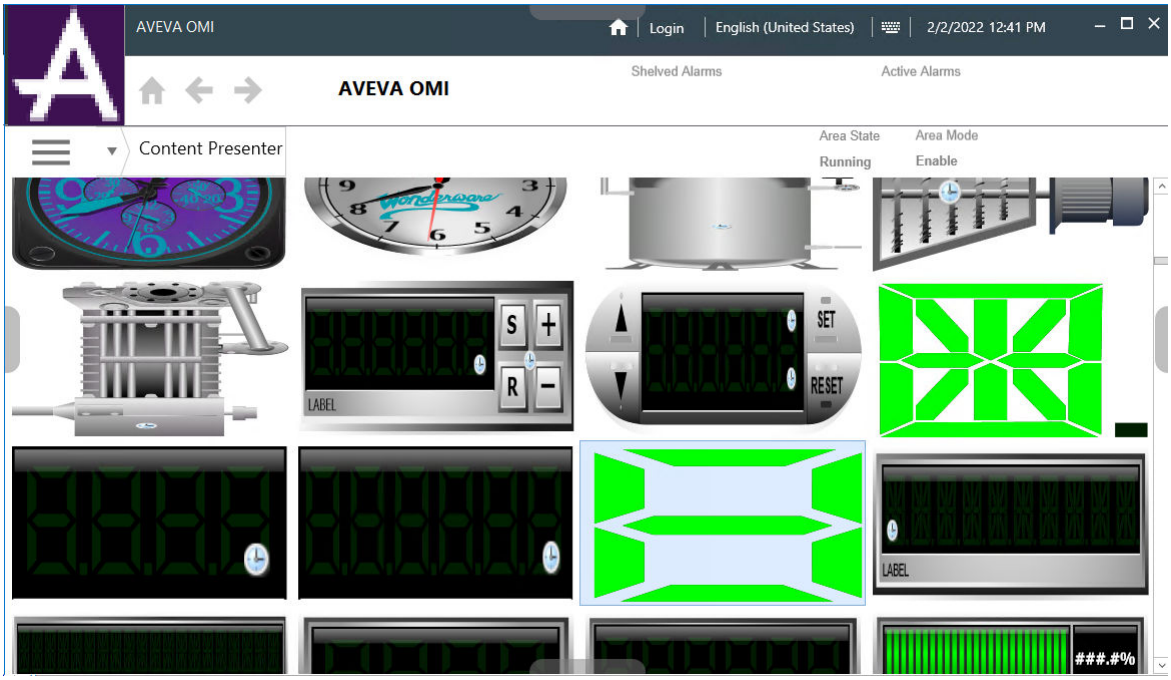
The figure above shows a fixed size cell with five pixels of padding around the graphic, which is placed at the top center of the cell. All cells in the view port have the same fixed width and height

The **Layout** and **Size** properties include other options to scale the size of view port cells to fit the size of graphics and specify the number of cells that appear in each row or column of the view port. The following example shows cells that are scaled to the width and height of the graphics placed within them. The **Display Columns** property has been set to 4 to always shows four columns of graphics in the view port.




Here is the same example again with the **Stretch** property enabled. The aspect ratio of a graphic is ignored and the graphic is enlarged in its non-constraining dimension of the cell. For example, the number 8 LED shown above is constrained by its height within its cell. When **Stretch** is enabled, the graphic width increases to the full width of the cell, as shown below.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.



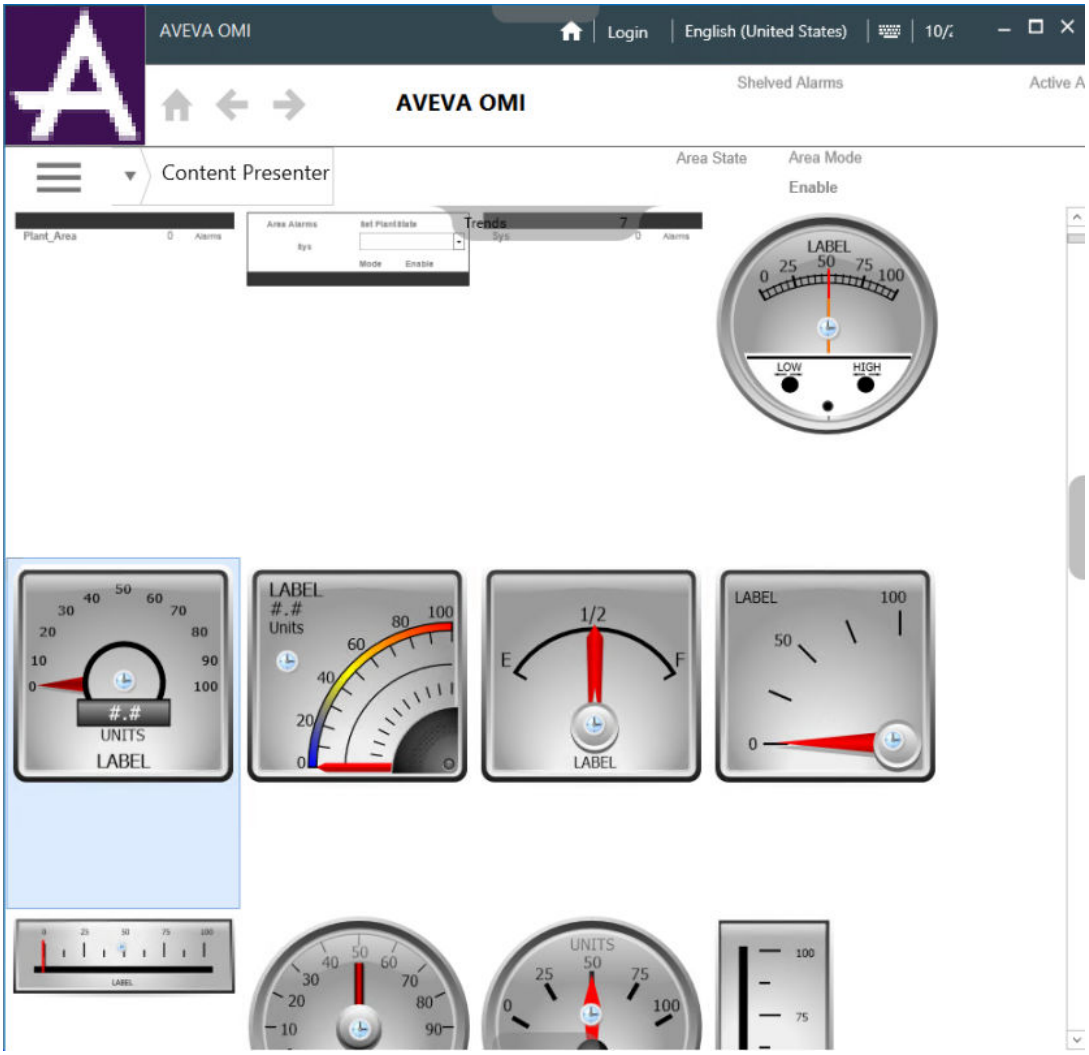

See More Information About ContentPresenter App Properties for a description of the configuration procedure and how the various property options affect the visual characteristics of graphics within a running ViewApp.

## ContentPresenter App Run Time Examples

During configuration, a ContentPresenter app is placed in a layout pane. The pane itself becomes the view port of the ContentPresentApp to show the graphics incorporated in the running ViewApp. The following figure shows the display of the ContentPresenter app during runtime. In this example, graphics are listed in horizontal order and wrap to the next row of the view port when a graphic cannot completely fit within the right view port border.

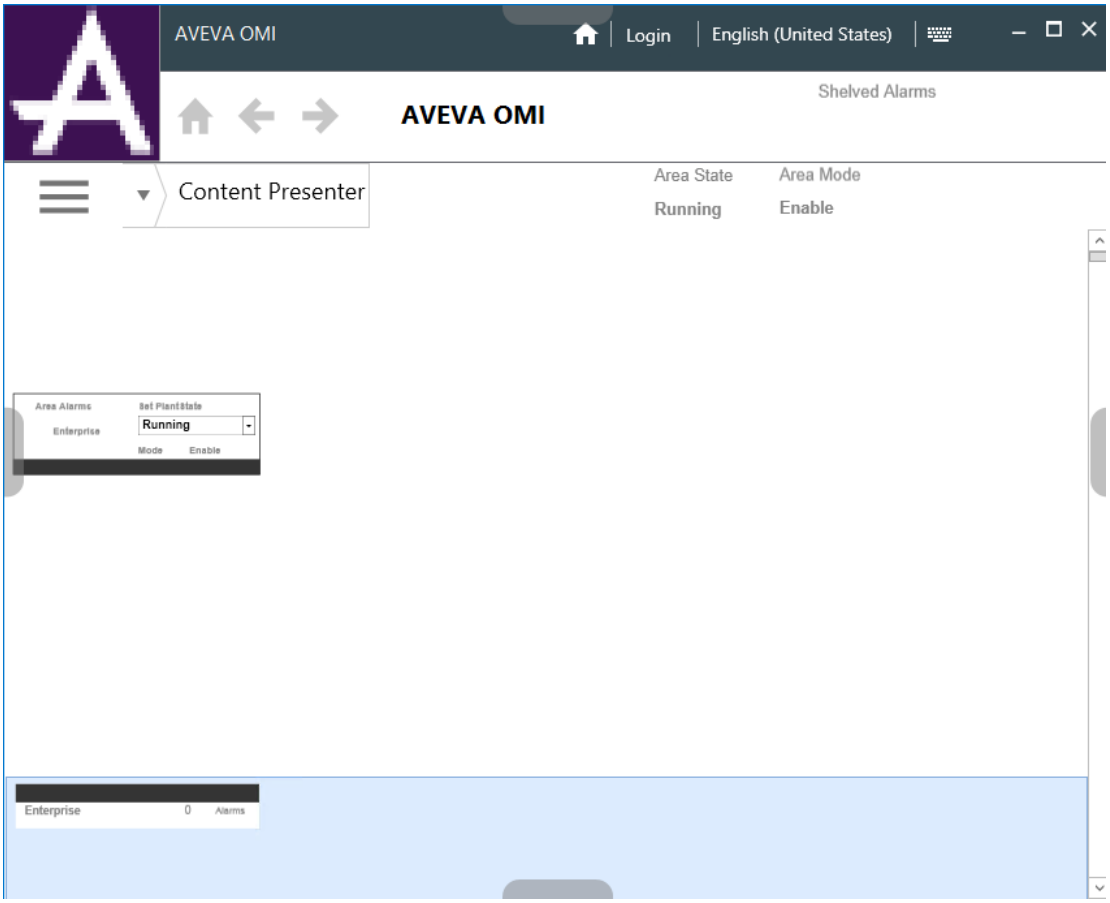
The size of the view port can be changed by adjusting the size of the layout pane to show more or fewer graphics on each row. Graphics continue to wrap to the next row until they extend beyond the bottom of the view port. Scroll bars appear to move the view port vertically and show the remaining graphics.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




This example shows a graphic display when the **Fill** property is set to **Horizontal** and the **View Mode** property is set to **WrapContent**. Both properties include other options to list graphics vertically and show the graphics in continuous sequential order without wrapping.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.



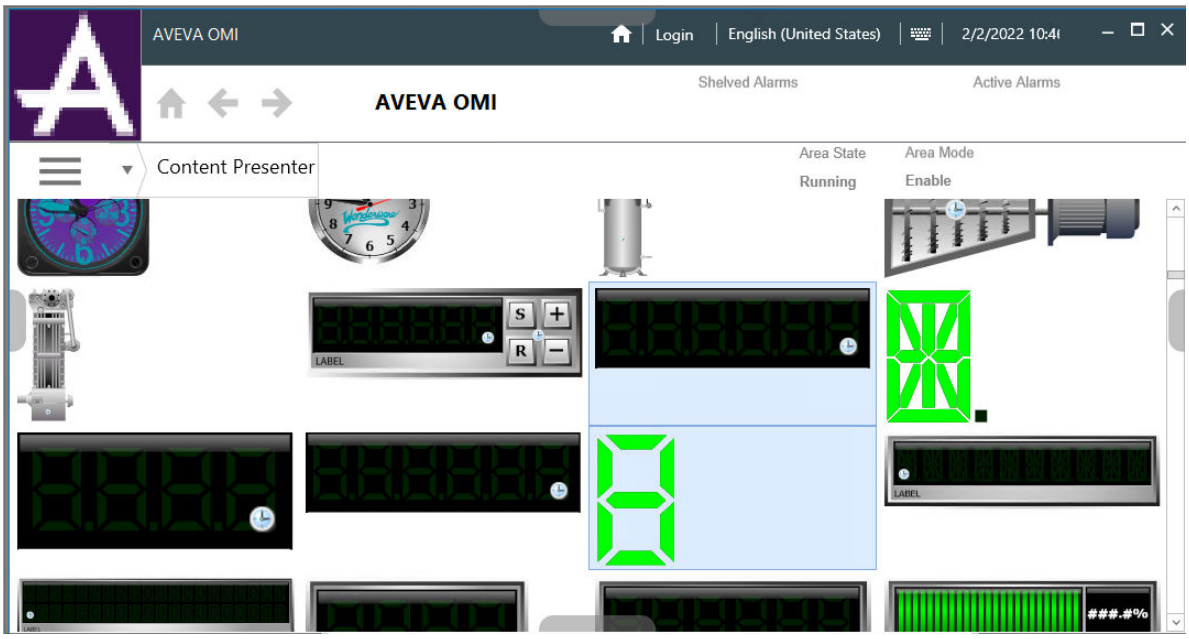

The blue background shown in both examples represents a cell within a view port. Each view port cell contains a single graphic. The ContentPresenter app includes a set of **Layout** and **Size** properties that determine the size of the cell, the blank space around the graphic, and the placement of the graphic within the cell.




© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

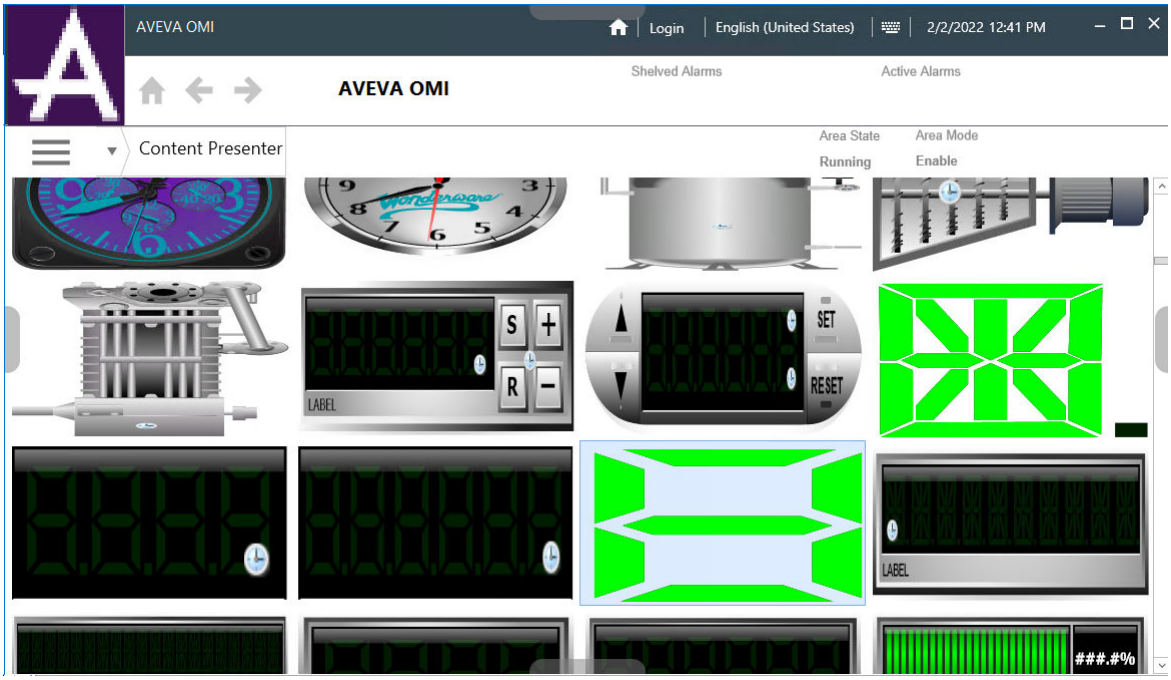
The figure above shows a fixed size cell with five pixels of padding around the graphic, which is placed at the top center of the cell. All cells in the view port have the same fixed width and height

The **Layout** and **Size** properties include other options to scale the size of view port cells to fit the size of graphics and specify the number of cells that appear in each row or column of the view port. The following example shows cells that are scaled to the width and height of the graphics placed within them. The **Display Columns** property has been set to 4 to always shows four columns of graphics in the view port.




Here is the same example again with the **Stretch** property enabled. The aspect ratio of a graphic is ignored and the graphic is enlarged in its non-constraining dimension of the cell. For example, the number 8 LED shown above is constrained by its height within its cell. When **Stretch** is enabled, the graphic width increases to the full width of the cell, as shown below.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




See More Information About ContentPresenter App Properties for a description of the configuration procedure and how the various property options affect the visual characteristics of graphics within a running ViewApp.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Configure the ContentPresenter App

The ContentPresenter app includes several sets of related properties that determine the search criteria to select the displayed graphic items, how they are items organized within a pane, their size, and how they behave when selected.

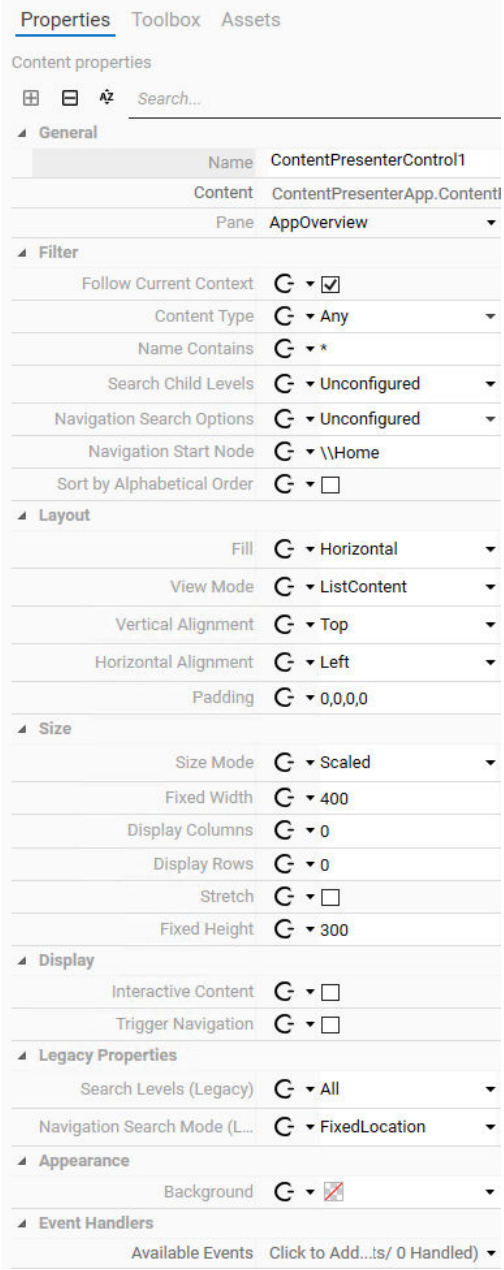
**To configure the ContentPresenter app**

1. Open the Layout or ViewApp Editor and show the items listed in the **Toolbox** tab.
2. Open the folder in the **Toolbox** where the ContentPresenter app is located. Typically, this is the **OMI Apps** folder.
3. Select ContentPresenterApp from the **Toolbox** list.
4. Drag and drop the ContentPresenterApp thumbnail onto a pane.
5. Select the ContentPresenterApp thumbnail and select the **Properties** tab.

   The **Properties** tab shows the properties of the ContentPresenter app. The following figure shows the default property values.

   See More Information About ContentPresenter App Properties for the details of each property.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




6. Set the property values of the ContentPresenter app.
7. Save your changes.

## More Information About ContentPresenter App Properties

ContentPresenter app properties can be shown in the Layout or ViewApps editors by placing the ContentPresenter app on a layout pane. After selecting the app, its properties appear on the **Properties** page by the functional groups shown in the following table.

Some combinations of property values are invalid. When a configuration error occurs, an error dialog appears when the ViewApp is deployed and starts running. The ContentPresenter app view port never appears in the layout pane of the running ViewApp. For more information, see ContentPreserter App Property Validation.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Filter Properties | |
|---|---|
| **Follow Current Context** | Determines if the currently selected node will be used as starting point for searching assets at run time.<br>• If enabled (default), the asset corresponding to the currently selected node is used the starting point for search.<br>• If disabled, the configured **Navigation Start Node** is used as the starting point for search.<br>**Note:** You must configure **Navigation Start Node** if this property is disabled.<br>---<br>Data Type: **Boolean** \| Default Value: **True** \| Runtime Property: **No**<br>Scriptable: **Yes** \| Bindable: **Yes** |
| **Content Type** | A drop-down list that shows the different types of graphic content that can be shown in the ContentPresenter app. **Any** is the default, which displays all graphic content types.<br>If one or more specific content types are selected, the ContentPresenter app restricts the display to only those graphic items that have a matching **ContentType** property value assigned from the Graphic Editor.<br>Use a comma as the delimiter to separate multiple content types in the **Content Type** field, for example:<br>`Any,Overview,Detailed,Faceplate`<br>See Content Type Property for more information.<br>---<br>Data Type: **Enum** \| Default Value: **Any** \| Runtime Property: **No**<br>Scriptable: **Yes** \| Bindable: **Yes** |
| **Name Contains** | Filter to restrict the graphic items shown in the ContentPresenter app to those graphics whose names match the search string entered as the **Name Contains** value. ***** is the default, which shows all graphics.<br>Asterisk (*) and question mark (?) wildcard characters can be entered as placeholder character replacements in the search string.<br>---<br>Data Type: **String** \| Default Value: ***** \| Runtime Property: **No**<br>Scriptable: **Yes** \| Bindable: **Yes** |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Filter Properties | |
|---|---|
| **Search Child Levels** | Determines the depth of the child hierarchy to be traversed for content search. This property is only used if “Child Levels” is selected under **Navigation Search Options.** Options are:<br>• **Unconfigured:** Navigation search options will function in *legacy* mode, and the legacy search properties **Search Levels** and **Navigation Search Mode** will be be automatically converted to their current equivalents (**Search Child Levels** and **Navigation Search Options**).<br>**Note:** Legacy properties are deprecated as of the System Platform 2023 release. Legacy mode and legacy search properties are described below, towards the end of this table.<br>• **All:** Searches all levels of the hierarchy below the currently-selected node.<br>• **OneLevel:** Searches only the level of the hierarchy immediately below the level of the currently-selected node.<br>• **TwoLevels:** Searches the two levels of the hierarchy immediately below the level of the currently-selected node.<br>**ThreeLevels:** Searches the three levels of the hierarchy immediately below the level of the currently-selected node.<br>**Note:** To include the current level of the hierarchy in searches, you must also enable the "Siblings" option in **Navigation Search Options**.<br>Data Type: **Enum** \| Default Value: **Unconfigured** \| Runtime Property: **No**<br>Scriptable: **Yes** \| Bindable: **Yes** |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Filter Properties | |
|---|---|
| **Navigation Search Options** | Determines which navigation search option(s) is/are enabled. Multiple search options can be selected.<br>• **Unconfigured:** Navigation search options will function in *legacy* mode, and the legacy search properties **Search Levels** and **Navigation Search Mode** will be be automatically converted to their current equivalents (**Search Child Levels** and **Navigation Search Options**).<br>**Note:** Legacy properties are deprecated as of the System Platform 2023 release. Legacy mode and legacy search properties are described below, towards the end of this table.<br>• **StartNode:** Search begins from a node, either specified by the Current Asset, or by the navigation path configured in the NavigationStartNode property.<br>• **Siblings:** Search begins from the sibling node of a StartNode and traverses all siblings of the start node.<br>• **ChildLevels:** Searches Child Nodes to the depth specified by the SearchChildLevels property.<br>Data Type: **Enum** \| Default Value: **Unconfigured** \| Runtime Property: **No**<br>Scriptable: **Yes** \| Bindable: **Yes** |
| **Navigation Start Node** | The node in the ViewApp's navigation model to start the search for graphic items to be shown in the ContentPresenter app. \\Home is the default starting node.<br>The starting node is always expressed as the navigation item pathway in the form:<br>`\\StartNode\node1\node2\node3`<br>**Navigation Search Mode** must be set to **FixedLocation** to enable the **Navigation Start Node** property.<br>Navigation Start Node is a bindable/run-time property that can be bound to a data reference, and the value can be changed dynamically at run time. See Navigation Start Node Property for more information.<br>Data Type: **String** \| Default Value: **\\Home** \| Runtime Property: **No**<br>Scriptable: **Yes** \| Bindable: **Yes** |
| **Sort by Alphabetic Order** | When selected, the ContentPresenter app displays graphics in ascending alphabetic order by name.<br>Data Type: **Boolean** \| Default Value: **False** \| Runtime Property: **No**<br>Scriptable: **Yes** \| Bindable: **Yes** |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Layout Properties | |
|---|---|
| **Fill** | Options to set **vertical** or **horizontal** fill order of graphics shown in the ContentPresenter app. Horizontal fill order is left to right within the view port. Vertical fill order is top to bottom within the view port. **Horizontal** is the default.<br>See Layout Properties for more information about the fill order of content.<br>---<br>Data Type: **Enum** \| Default Value: **Horizontal** \| Runtime Property: **No**<br>Scriptable: **Yes** \| Bindable: **Yes** |
| **View Mode** | Determines the organization of graphic items shown within the viewer port of the ContentPresenter app.<br>• **ListContent:** Graphic items are shown in the ContentPresenter app as a continuous sequential list. Based on the value specified for the **Fill** property, the list is arranged in vertical or horizontal order. The default view mode.<br>Scroll bars appear when the graphic list extends beyond the borders of the view port.<br>• **WrapContent:** Graphics are listed in the fill direction until a graphic does not fit within the border of the view port. The graphic then wraps to the next column or row within the view port. Scroll bars appear when the graphic item list extends beyond the view port borders.<br>• **GridContent:** Use of GridContent mode is NOT recommended. This mode has been deprecated, but is retained to support ViewApps developed with an earlier version of the ContentPresenter app. When specified, graphics wrap in the direction specified by the **Fill** property. See Updates to the ContentPresenter App for a description of backward compatibility in the ContentPresenter app when **GridContent** is selected.<br>See Layout Properties for more information about other **View Mode** options.<br>---<br>Data Type: **Enum** \| Default Value: **ListContent** \| Runtime Property: **No**<br>Scriptable: **Yes** \| Bindable: **Yes** |
| **Vertical Alignment** | Vertical alignment (**Top**, **Center**, **Bottom**) of the graphic within a cell of the ContentPresenter app view port.<br>---<br>Data Type: **Enum** \| Default Value: **Top** \| Runtime Property: **No**<br>Scriptable: **Yes** \| Bindable: **Yes** |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Layout Properties | |
|---|---|
| **Horizontal Alignment** | Horizontal alignment (**Left**, **Center**, **Right**) of the graphic within a cell of the ContentPresenter app view port.<br><br>Data Type: **String** \| Default Value: **Left** \| Runtime Property: **No**<br>Scriptable: **Yes** \| Bindable: **Yes** |
| **Vertical Alignment** | Vertical alignment (**Top**, **Center**, **Bottom**) of the graphic within a cell of the ContentPresenter app view port.<br><br>Data Type: **Enum** \| Default Value: **Top** \| Runtime Property: **No**<br>Scriptable: **Yes** \| Bindable: **Yes** |
| **Padding** | Number of pixels as blank space padding on the left, right, top, and bottom of a graphic shown in the ContentPresenter app. 0,0,0,0 is the default, which does not provide any padding.<br>See Padding Property for more information.<br><br>Data Type: **Integer Array** \| Default Value: **0,0,0,0** \| Runtime Property: **No**<br>Scriptable: **Yes** \| Bindable: **Yes** |
| **Size Properties** | |
| **Size Mode** | Options to set the size of graphics shown in the ContentPresenter app by a fixed or scaled size. **Scaled** is the default size mode.<br>• **Scaled:** Graphic size is scaled to the constraining horizontal or vertical dimension of the containing view port cell while maintaining the aspect ratio of the graphic.<br>Cell size is an inverse function of the number of cells specified to appear in the view port. Cell size decreases with an increasing number of rows and columns in the view port. The number of cells shown in a view port is determined by the **Display Rows** and **Display Columns** properties.<br>• **Fixed:** The cells shown in the view port are set to a fixed width and height in pixels. Graphic size is determined by its constraining dimension when placed in the fixed fixed width or height of the cell.<br>The width and height values of view port cells are specified from the **Fixed Width** and **Fixed Height** properties.<br>See Details of the Size Mode Property for more information.<br><br>Data Type: **Enum** \| Default Value: **Scaled** \| Runtime Property: **No**<br>Scriptable: **Yes** \| Bindable: **Yes** |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Size Properties | |
|---|---|
| **Fixed Width** | Number of pixels as the width of a cell within the view port of the ContentPresenter app. The size of a graphic is restricted by the constraining dimension of a cell while maintaining the graphic's aspect ratio.<br>The **Size Mode** property must be set to **Fixed** to enable the **Fixed Width** and **Fixed Height** properties.<br>---<br>Data Type: **Integer** \| Default Value: **400** \| Runtime Property: **No**<br>Scriptable: **Yes** \| Bindable: **Yes** |
| **Fixed Height** | Number of pixels as the height of a cell within the view port of the ContentPresenter app.<br>The **Size Mode** property must be set to **Fixed** to enable the **Fixed Width** and **Fixed Height** properties.<br>---<br>Data Type: **Integer** \| Default Value: **300** \| Runtime Property: **No**<br>Scriptable: **Yes** \| Bindable: **Yes** |
| **Display Columns** | Number of columns containing graphics shown in a view port. Column numbers are specified as integers.<br>The ContentPresenter app view pane includes a horizontal scroll bar to show columns outside of the limit set by the Display Columns property.<br>See Display Columns Property for more information.<br>---<br>Data Type: **Integer** \| Default Value: **0** \| Runtime Property: **No**<br>Scriptable: **Yes** \| Bindable: **Yes** |
| **Display Rows** | Number of rows containing graphics shown in a Content Presenter view port. Row numbers are specified as integers.<br>The ContentPresenter app view port includes a vertical scroll bar to show rows outside of the limit set by the Display Rows property.<br>See Display Rows Property for more information.<br>---<br>Data Type: **Integer** \| Default Value: **0** \| Runtime Property: **No**<br>Scriptable: **Yes** \| Bindable: **Yes** |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Size Properties | |
|---|---|
| **Stretch** | When **Stretch** is enabled, the horizontal/vertical aspect ratio of a graphic changes to fill the available space of the non-constraining dimension within a cell of a Content Presenter view port.<br>The **Display Rows** and **Display Columns** properties must be set to non-zero values to enable the **Stretch** property.<br>See Stretch Property for more information.<br>---<br>Data Type: **Boolean** \| Default Value: **False** \| Runtime Property: **No**<br>Scriptable: **Yes** \| Bindable: **Yes** |
| **Display Properties** | |
| **Interactive Content** | Boolean value that determines whether graphics shown by the ContentPresenter App are interactive or not. When **Interactive Content** is selected, the scripts and animations of selected graphic items from the ContentPresenter app are enabled.<br>Both **Display** properties can be selected simultaneously. In the case when both properties are selected, **Trigger Navigation** takes precedence and the **Interactive Content** property value is not honored.<br>---<br>Data Type: **Boolean** \| Default Value: **False** \| Runtime Property: **No**<br>Scriptable: **Yes** \| Bindable: **Yes** |
| **Trigger Navigation** | Boolean value that determines whether a selected graphic shown by the ContentPresenter app can set the focus within the running ViewApp to the navigation item containing the graphic. When the user selects a graphic item shown by the ContentPresenter app, the current focus of the ViewApp is set to the navigation item containing the graphic.<br>Both **Display** properties can be selected simultaneously. In the case when both properties are selected, **Trigger Navigation** takes precedence and the **Interactive Content** property value is ignored.<br>---<br>Data Type: **Boolean** \| Default Value: **False** \| Runtime Property: **No**<br>Scriptable: **Yes** \| Bindable: **Yes** |

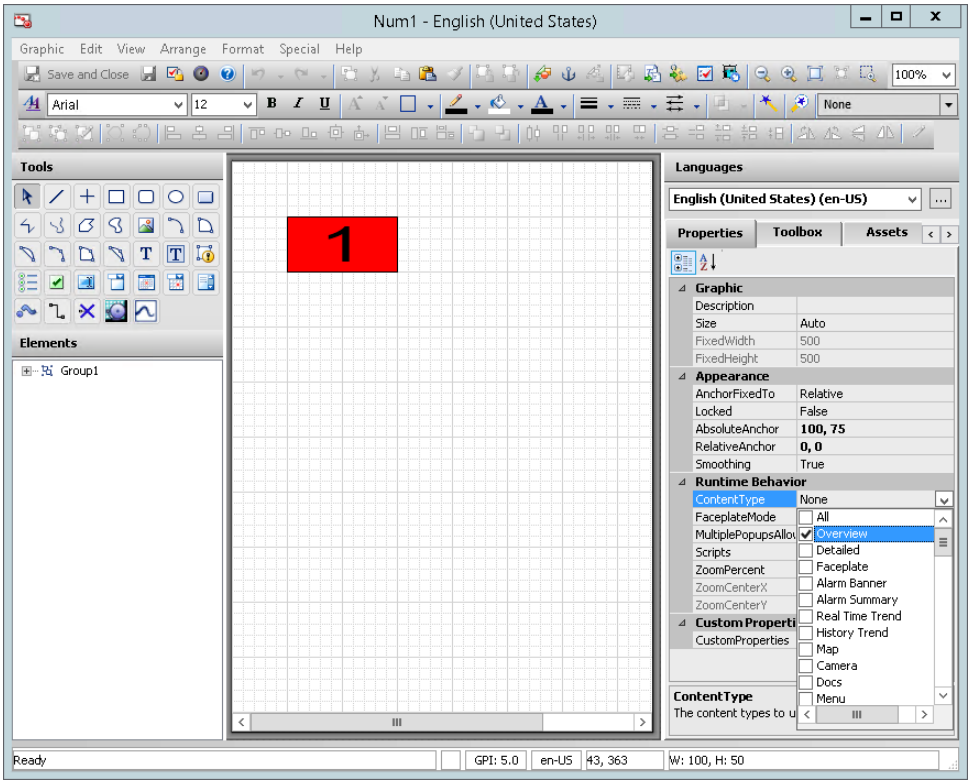
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Legacy Properties | |
|---|---|
| **Search Levels** | This property is deprecated as of the System Platform 2023 release, but is maintained to ensure that existing ViewApps will continue to function as expected, without reconfiguration.<br><br>Options to set the number of node levels (1,2,3, All) at and beneath the starting node in the hierarchical ViewApp navigation model to search for graphics shown in the ContentPresenter app. All is the default, which shows all graphics at the starting node and all nodes beneath it in the navigation model.<br><br>See Search Levels Property (Deprecated) for more information.<br><br>Data Type: **Enum** \| Default Value: **All** \| Runtime Property: **No**<br><br>Scriptable: **Yes** \| Bindable: **Yes** |
| **Navigation Search Mode** | This property is deprecated as of the System Platform 2023 release, but is maintained to ensure that existing ViewApps will continue to function as expected, without reconfiguration.<br><br>Options to set the boundaries of a search within the node levels of a ViewApp navigation model.<br><br>• **FixedLocation:** The search starts at the navigation node specified by the Navigation Start Node property and continues within the hierarchy of the navigation model based on the number of navigation node levels set by the Search Levels property.<br>• **CurrentNav:** The search starts from the current selected navigation node of the ViewApp and potentially its children based on the value set for the Search Levels property.<br>• **ChildrenAlone:** The search starts from the child nodes beneath the current selected navigation node and potentially the children of the children if the Search Levels property is set to search Two Levels or Three Levels.<br><br>Data Type: **Enum** \| Default Value: **FixedLocation** \| Runtime Property: **No**<br><br>Scriptable: **Yes** \| Bindable: **Yes** |
| **Appearance Property** | |
| **Background** | Background color of the ContentPresenter app view port. Select the **Background** field to show a color picker to set the background color. No color is the default background.<br><br>Data Type: **Color Picker** \| Default Value: **No color** \| Runtime Property: **No**<br><br>Scriptable: **Yes** \| Bindable: **Yes** |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

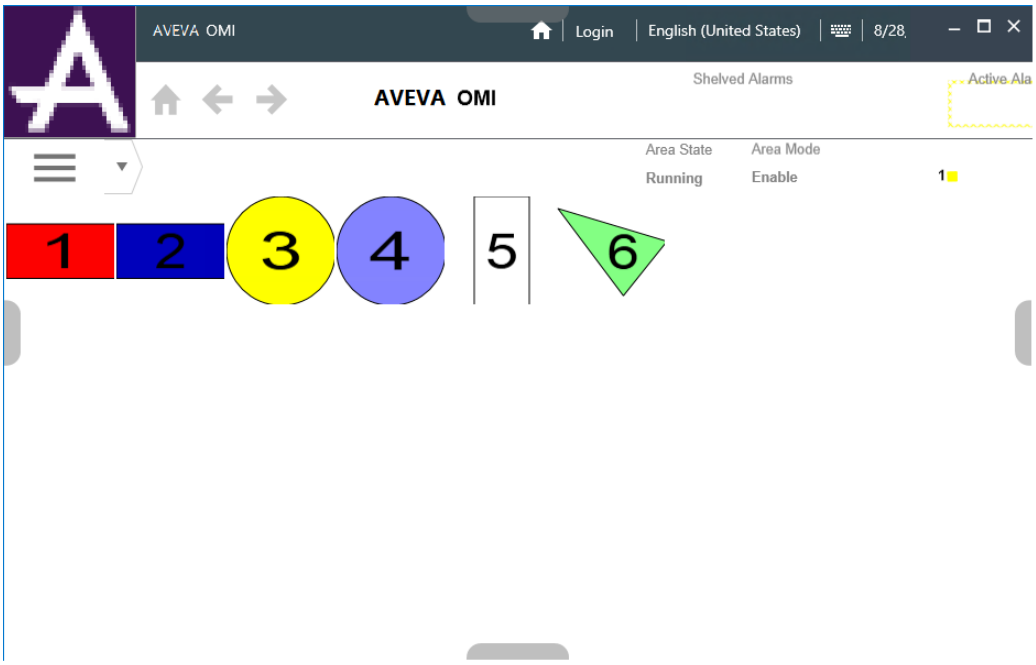
## Content Type Property

By default, a System Platform graphic is not assigned a value for its **ContentType** property. A graphic can be assigned a **ContentType** property value in the Graphic Editor. The following figure shows the Num1 graphic has been assigned **Overview** as its **ContentType** property value. The ContentPresenter app can restrict the display of graphics to those that have been assigned a matching **ContentType** property value.

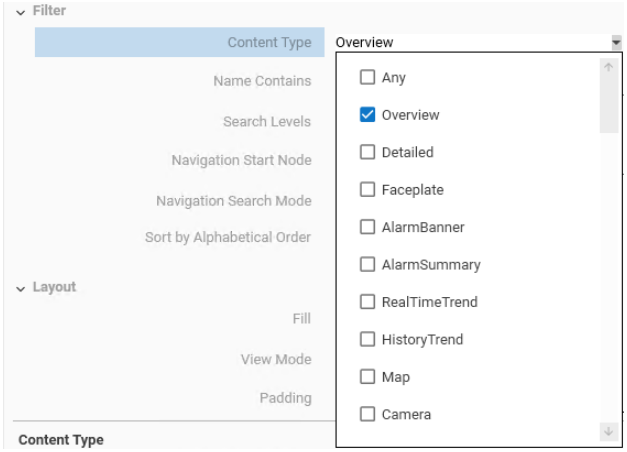



The default value of the **ContentType** property is **Any**, which shows all graphics regardless of each graphic's assigned **ContentType** property.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

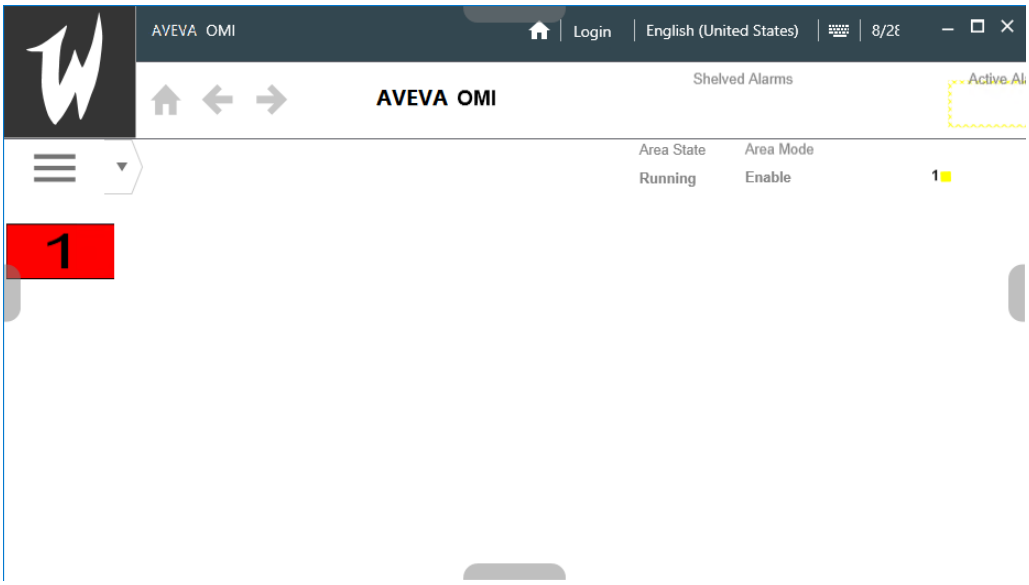



You can select one or more **ContentType** properties from a drop-down list in the **Properties** area.




When the **ContentType** property is assigned one or more values, the ContentPresenter app restricts the display to only those graphics with a matching **ContentType** property

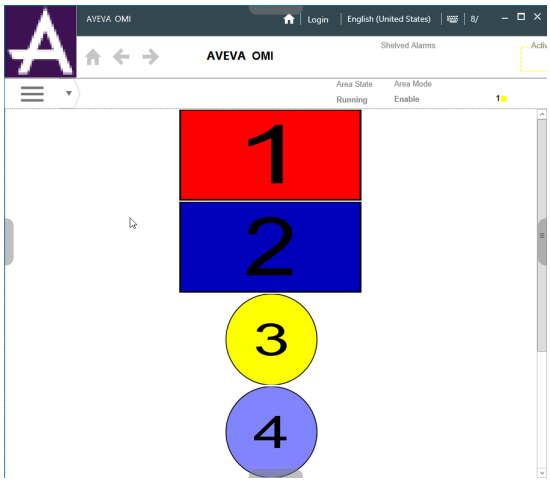
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

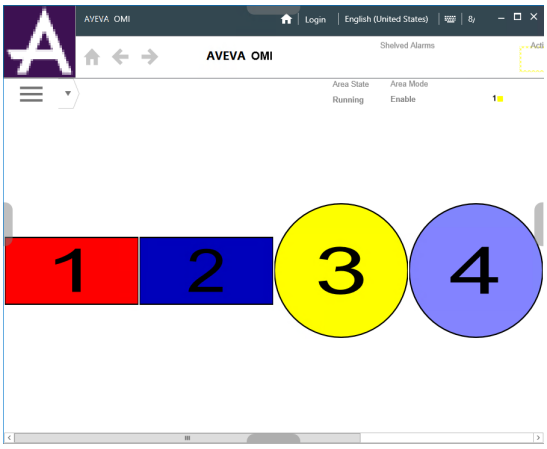



## Layout Properties

The **Fill** property includes two options to order graphic items in the ContentPresenter app horizontally or vertically.

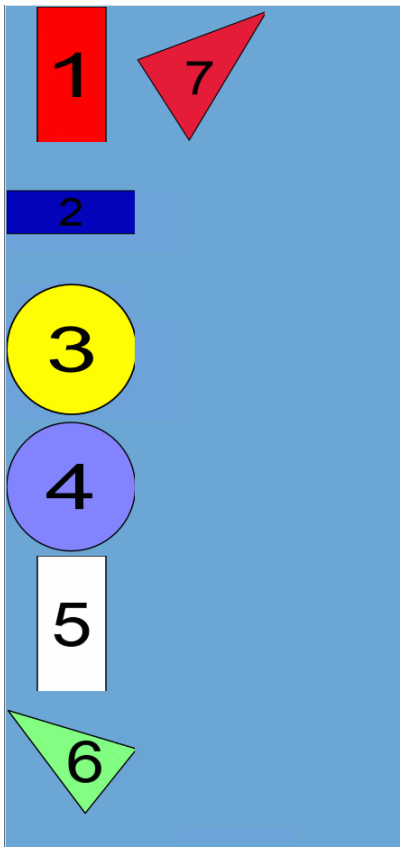
When the **ViewMode** property is set to **ListContent,** the viewer pane includes scroll bars to view graphic items that extend beyond the bottom or right border of the viewer pane.

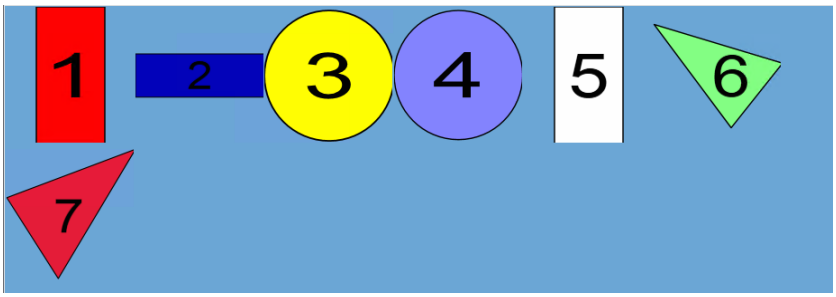



When the **ViewMode** property is set to **WrapContent,** graphics appear on the next row or next column based on whether the **Fill** property value is **Horizontal** or **Vertical**.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

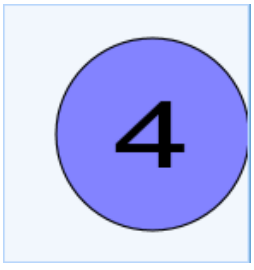



## Padding Property

Padding is the blank space placed around the borders of a graphic when it appears in the ContentPresenter app while a ViewApp is running.

Padding values are specified by the number of pixels placed at the left, top, right, and bottom borders of a graphic specified as four positional integers separated by commas.

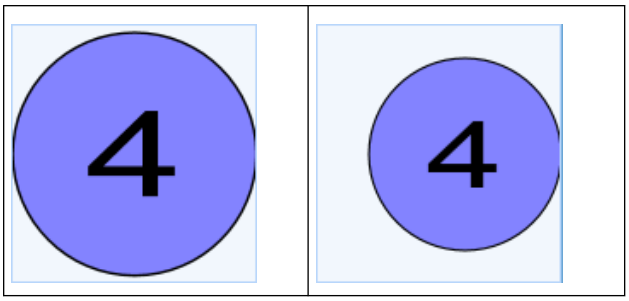
| 30,0,0,0 | 0,30,0,0 | 0,0,30,0 | 0,0,0,30 |
|---|---|---|---|
| Left Padding | Top Padding | Right Padding | Bottom Padding |
|  |  |  |  |



The aspect ratio of a graphic is maintained when padding is applied. In the case when a graphic extends beyond a cell border of the ContentPresenter app window because of padding, the graphic is reduced in size until it fits within the border while including the padding space.

| No Padding | Left Padding |
|---|---|

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




### Display Columns Property

The value assigned to the **DisplayColumns** property determines the number of columns that appear within the ContentPresenter app viewer window. A non-zero value shows graphics in the specified number of columns and the graphics are scaled to fit the width of each column. The remaining graphics beyond the column limit appear on the next row of the view pane.

A value of zero indicates the **Display Columns** property is ignored and graphics appear in the viewer window in as many columns as calculated based on the values of other ContentPresenter app properties.

### Display Rows Property

The **Display Rows** property specifies the number of graphic items that can be placed on a row within the ContentPresenter app view pane.

If a value is specified then Content will be Fit to the height of the Row. A value of Zero indicates that Row specification is ignored and contents will be shown in as many Rows as calculated based on various factors such Contents Size, Fill Mode, Size Mode, Pane size etc.

Graphic items beyond the value set to the **Display Rows** property appear on rows beyond the current view pane.

### Size Mode Property

The **Size Mode** property includes two options that determine the size of a graphic shown by the ContentPresenter app.

- **Scaled**

  The size of graphics shown in the ContentPresenter app are scaled to a percentage of their actual dimensions and still maintain their original aspect ratio. Graphic size is determined by the constraining dimension of cells shown in the ContentPresenter app view port.

  Graphic size is a function of the number of cells shown in the view port. If their are many cells, graphic size must be necessarily smaller to fit within the dimensions of small cells. The **Display Rows** and **Display Columns** properties specify the number of cells shown in the view port.

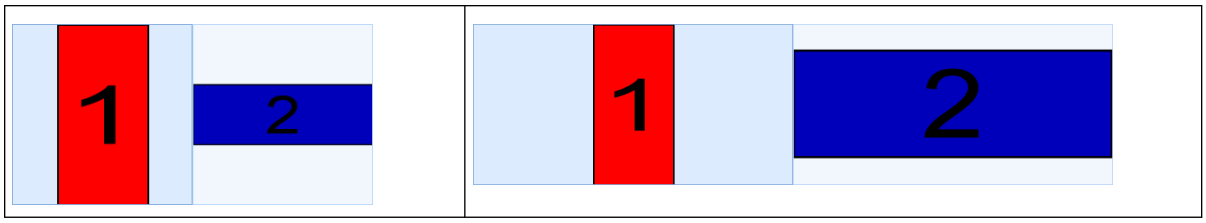
- **Fixed**

  The **Fixed Width** and **Fixed Height** properties specify the pixel width and height of a cell within the view pane of the ContentPresenter app.

  The following example shows the different sizes of the same graphics when the **Fixed Width** property cell width is set to 200 and 400. The constraining vertical or horizontal dimension of a view cell determines the size of a graphic at its original aspect ratio.

| **Fixed Cell Width 200** | **Fixed Cell Width 400** |
|---|---|

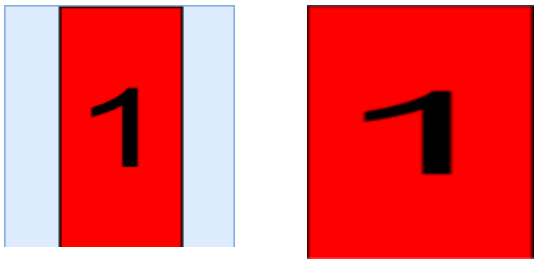
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




## Stretch Property

When enabled, the **Stretch** property increases the size of a graphic within a cell of the ContentPresenter app view pane in its non-constrained horizontal or vertical dimension. The original aspect ratio of the graphic is ignored.

**Original Graphic** **Stretched Graphic**




The **Display Columns** and **Display Rows** properties must be set to non-zero values to enable the **Stretch** property.

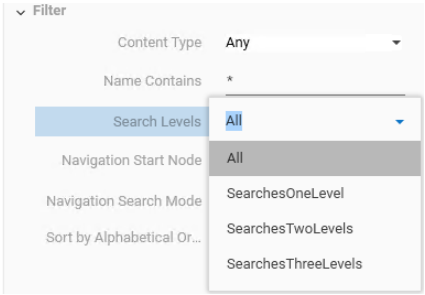
## Search Levels Property (Deprecated)

The **Search Levels** property and the **Navigation Search Mode** property are both deprecated as of the System Platform 2023 release, but remain available in this release to preserve compatibility with applications created in prior versions. To replace and enhance the functionality of these deprecated properties, two new properties, **Search Child Levels** and Navigation **Search Options**, were added. To preserve the functionality of the deprecated properties, set the new properties "**Search Child Levels**" and "**Navigation Search Options**" properties to "**Unconfigured**."

The deprecated **Search Levels** and **Navigation Search Mode** properties have been moved from the **Filter** properties category to the **Legacy** properties category.

### Search Levels Property Behavior

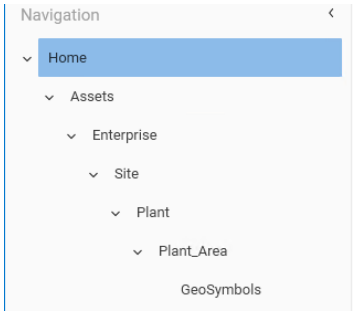
The **Search Levels** property includes four options to search for graphic items in the hierarchy of a ViewApp navigation model starting from the navigation node set as the start node by the **Navigation Start Node** property. **All** is the default option to search all hierarchical node levels, which includes the active node of the navigation model and all of its child nodes beneath it.



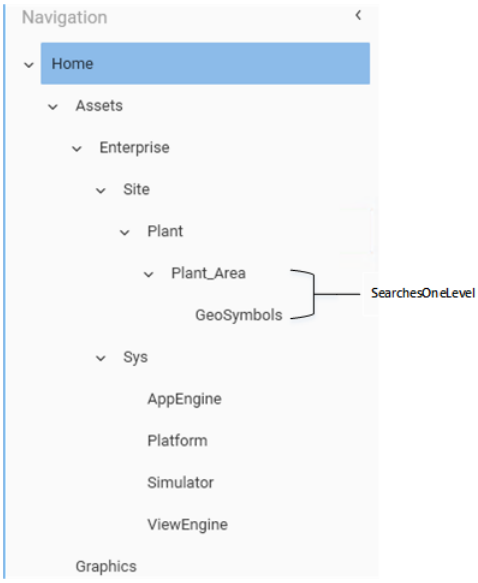

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

The remaining options of the **Search Levels** property set the scope of the graphic search within a ViewApp navigation model to the active node and the number of child nodes (1, 2, or 3) beneath the active node.

The following figure shows the navigation model of a ViewApp with its hierarchy of navigation nodes. The GeoSymbols node contains a set of geographic graphics.




The **Search Levels** property has been set to **SearchesOneLevel**. The **Navigation Search Mode** property is set to **CurrentNav**.The geographic graphics do not appear in the ContentPresenter app unless the user sets the focus of the ViewApp to the Plant_Area or GeoSymbols nodes.




## Contextualization

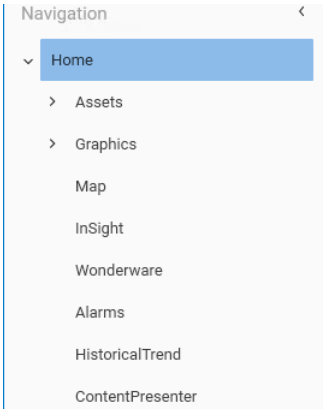
Content can be contextualized within the ContentPresenter app. Contextualization is enabled by setting the **Follow Current Context** property to true. With contextualization enabled, the asset applicable to the currently-selected asset is used as the starting point for search. This is the default setting. If contextualization is disabled, you must configure the **Navigation Start Node** property to provide a starting point for navigation.

### Navigation Start Node Property

\\Home is the default value assigned to the **Navigation Start Node** property, which is the top navigation item or node shown by the ViewApp editor in an hierarchical navigation model. Based on default values assigned to other properties, the ContentPresenter app shows all graphics assigned to a ViewApp because \\Home is the top most node in the hierarchy of a navigation model.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

**Navigation Start Node** is a dynamic, scriptable property. If **Follow Current Content** is not selected (disabled), **Navigation Start Node** must be set, either by data binding or through scripting.




The value assigned to the **Navigation Start Node** property restricts the display of graphics starting from a specific node in the hierarchy of the navigation model rather than \\Home.

The **Navigation Search Mode** (legacy) property must be set to **FixedLocation** to enable the **Navigation Start Node** property. The graphics belonging to the starting node and the hierarchical child nodes of the starting node can be shown based on the value assigned to the **Search Levels** property.

## ContentPresenter OMI App Scripting

The ContentPresenter app has two scriptable properties: Follow Current Context and Navigation Search Mode. Only one property, Navigation Search Mode is bindable, allowing you to change its value via scripting at run time.

Script statements can be specified using the MyContent Namespace format in layout scripting by the following syntax formats:

MyContent.*name of the ContentPresenter App instance*.*ContentPresenterApp_Method*(parameter_1, parameter_2, parameter_n);

or

MyContent.*name of the ContentPresenter App instance.ContentPresenterApp_Property* = xxx

### Scripting Methods

The ContentPresenter OMI App includes the **Refresh()** scripting method for layout scripts.

### Content Presenter OMI App and Layout Scripts

The following table summarizes ContentPresenter OMI App properties, their data types, and their default values. The scriptable property name Navigation Start Node, when used in a layout script, is entered as a single word without blank spaces.

| PI Vision App Properties | Data Type | Default Value | Scriptable | Bindable |
|---|---|---|---|---|
| Follow Current Context | Boolean | True | No | YES |
| Content Type | Enum | Any | No | No |
| Name Contains | String | * | No | No |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | | | | |
|---|---|---|---|---|
| Search Child Levels | Enum | Unconfigured | No | No |
| Navigation Search Options | Enum | Unconfigured | No | No |
| Navigation Start Node | String | \\Home | YES | YES |
| Sort by Alphabetic Order | Boolean | False | No | No |
| Fill | Enum | Horizontal | No | No |
| View Mode | Enum | ListContent | No | No |
| Vertical Alignment | Enum | Top | No | No |
| Horizontal Alignment | Enum | Left | No | No |
| Padding | System.Windows.Thickness | 0,0,0,0 | No | No |
| Size Mode | Enum | Scaled | No | No |
| Fixed Width | Double | 400 | No | No |
| Display Columns | Integer | 0 | No | No |
| Display Rows | Integer | 0 | No | No |
| Stretch | Boolean | False | No | No |
| Fixed Height | Double | 300 | No | No |
| Interactive Content | Boolean | False | No | No |
| Trigger Navigation | Boolean | False | No | No |
| Search Levels | Enum | All | No | No |
| Navigation Search Mode | Enum | Fixed location | No | No |
| Background | System.Windows.Media.Brush | No color | No | No |

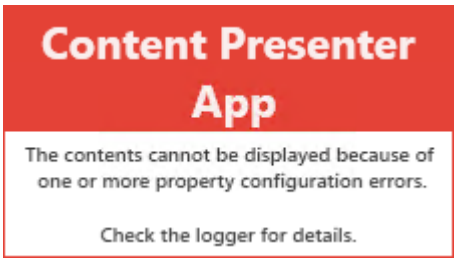
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# ContentPreserter App Property Validation

The properties listed in the ContentPresenter app property grid are validated during design time to ensure proper configuration.

For most of the properties, design time validation occurs only when the property value is modified in the property grid. If the property is not modified in the property grid, validation will occur when the ViewApp is deployed to run time. Values entered for properties are checked, and if the required minimum configuration is not met, an visual cue indicating the error is shown in the app, and details of the error are sent to the Operations Control Logger.

When invalid ContentPresenter app property values are detected at deployment, an error message appears when the ViewApp containing the ContentPresenter app starts. The ViewApp continues running, but the pane containing the ContentPresenter app shows an error message.




The ContentPresenter app validates two sets of configuration property values:

- Invalid row or column counts

  The **Display Rows** or **Display Columns** properties are set to a negative number.

- Invalid view port cell size

  The **SizeMode** property is set to **Fixed** and the **Fixed Width** and **Fixed Height** properties are configured to 0.

Check the Operations Control Logger for one or more messages that describe the specific configuration error.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Graphic Displays During Runtime

This section describes some typical graphic displays by configuring specific combinations of ContentPresenter app properties. Each section shows an example screen shot of the ContentPresenter app view port with specific combinations of property values.

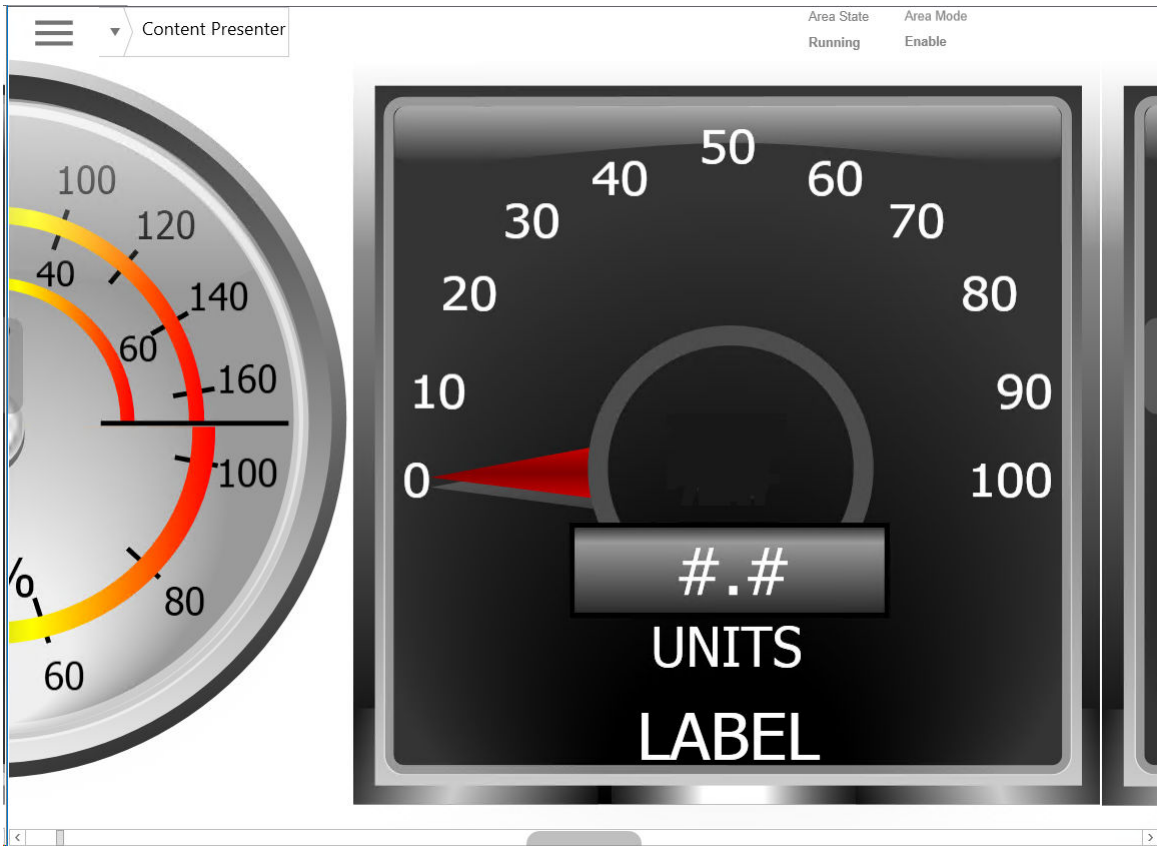
## List Graphics Horizontally and Vary the Number of Displayed Rows and Columns

The following examples show horizontal and scaled sequential lists of graphics when the number of displayed rows and columns vary.

### Horizontal List With No Specified Rows or Columns

| **Properties** | **Assigned Values** |
|---|---|
| **Fill** | Horizontal |
| **View Mode** | ListContent |
| **Padding** | 0,0,0,0 |
| **Horizontal Alignment** | Left |
| **Vertical Alignment** | Top |
| **Size Mode** | Scaled |
| **Display Rows** | 0 |
| **Display Columns** | 0 |
| **Stretch** | Disabled |
| **Fixed Width** | 200 ignored because **Size Mode** is set to Scaled |
| **Fixed Height** | 300 ignored because **Size Mode** is set to Scaled |

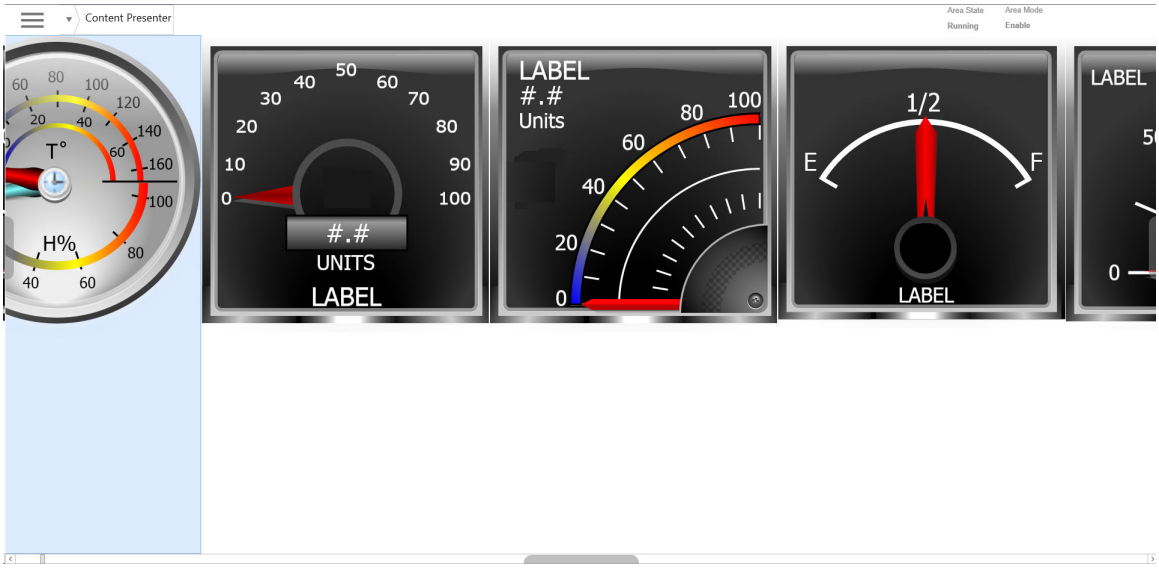
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




## Horizontal List With Multiple Rows and Columns

| Properties | Assigned Values |
|---|---|
| **Fill** | Horizontal |
| **View Mode** | ListContent |
| **Padding** | 0,0,0,0 |
| **Horizontal Alignment** | Left |
| **Vertical Alignment** | Top |
| **Size Mode** | Scaled |
| **Display Rows** | 3 |
| **Display Columns** | 4 |
| **Stretch** | Disabled |
| **Fixed Width** | 200 ignored because **Size Mode** is set to Scaled |
| **Fixed Height** | 300 ignored because **Size Mode** is set to Scaled |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




Graphics are smaller because the view port shows four columns of cells specified by the **Display Columns** property.

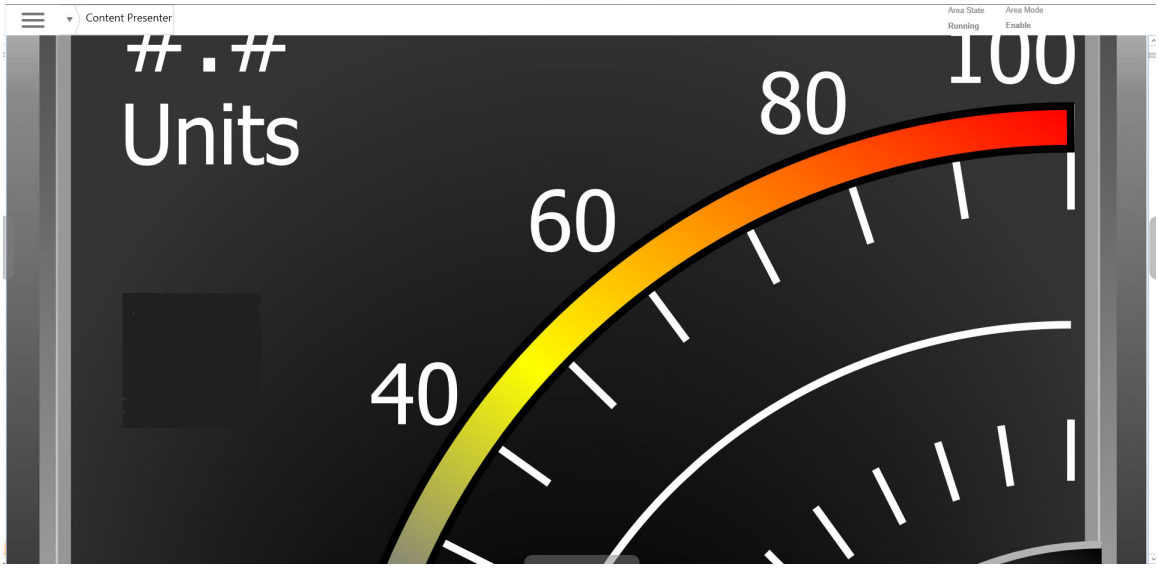
## List Graphics Vertically and Vary the Number of Displayed Rows and Columns

The following examples show vertical and scaled sequential lists of graphics when the number of displayed rows and columns vary.

### Vertical List With No Specified Rows or Columns

| Properties | Assigned Values |
|---|---|
| **Fill** | Vertical |
| **View Mode** | ListContent |
| **Padding** | 0,0,0,0 |
| **Horizontal Alignment** | Left |
| **Vertical Alignment** | Top |
| **Size Mode** | Scaled |
| **Display Rows** | 0 |
| **Display Columns** | 0 |
| **Stretch** | Disabled |
| **Fixed Width** | 200 ignored because **Size Mode** is set to Scaled |
| **Fixed Height** | 300 ignored because **Size Mode** is set to Scaled |

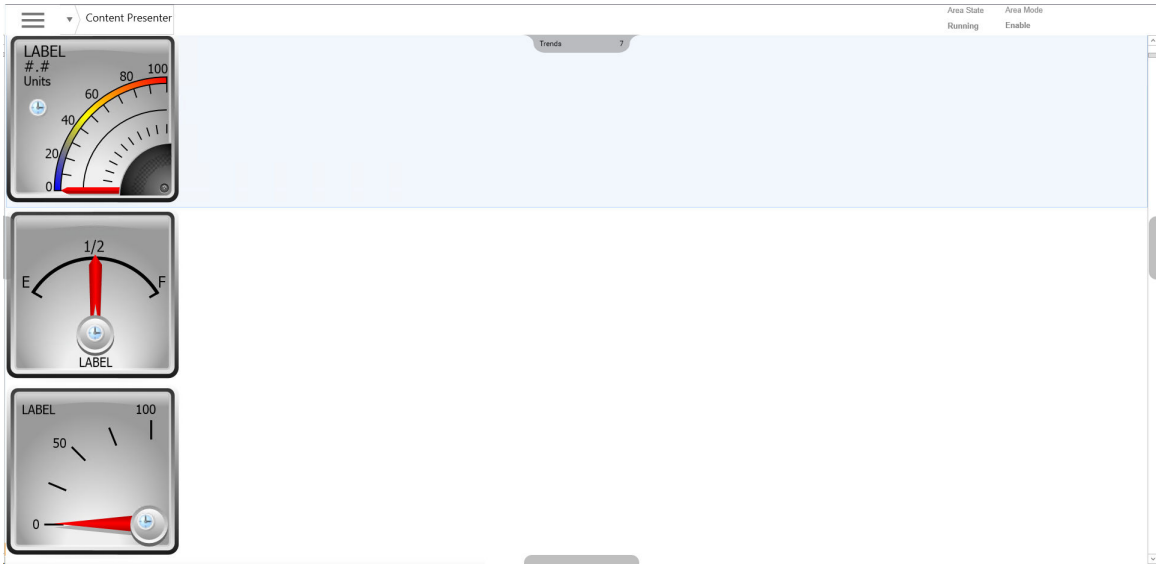
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




## Vertical List With Multiple Rows and Columns

| Properties | Assigned Values |
|---|---|
| **Fill** | Vertical |
| **View Mode** | ListContent |
| **Padding** | 0,0,0,0 |
| **Horizontal Alignment** | Left |
| **Vertical Alignment** | Top |
| **Size Mode** | Scaled |
| **Display Rows** | 3 |
| **Display Columns** | 4 |
| **Stretch** | Disabled |
| **Fixed Width** | 200 ignore because **Size Mode** is set to Scaled |
| **Fixed Height** | 300 ignore because **Size Mode** is set to Scaled |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




Graphics are smaller because the view port shows three of cells specified by the **Display Rows** property.

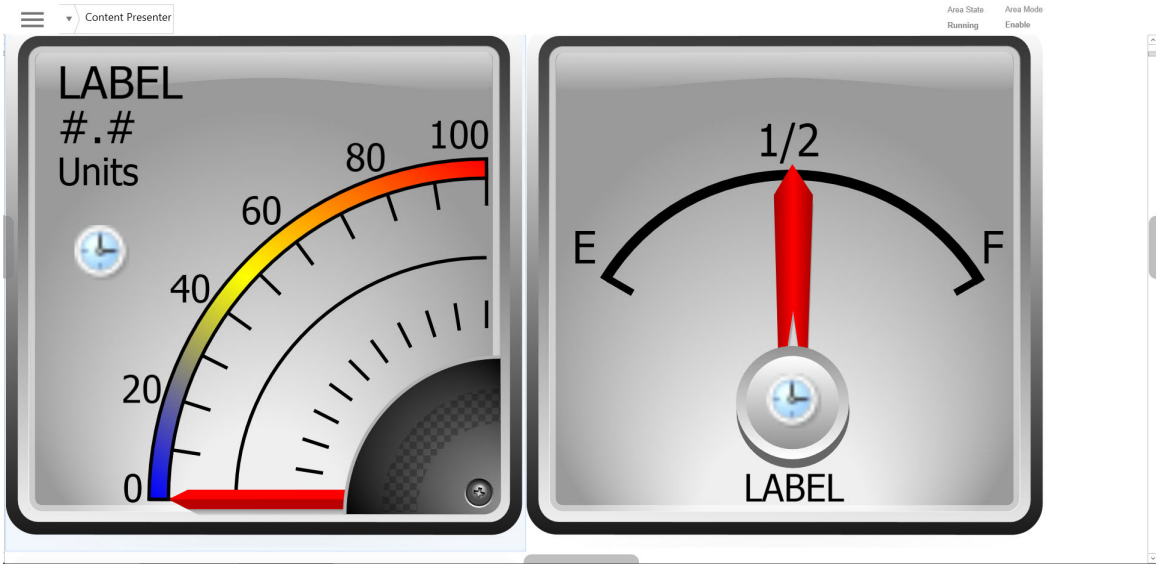
## Wrapped Horizontal List and Vary the Number of Display Rows and Columns

The following examples show wrapped and scaled horizontal lists of graphics when the number of displayed rows and columns vary.

### Wrapped Horizontal List With No Specified Rows or Columns

| Properties | Assigned Values |
|---|---|
| **Fill** | Horizontal |
| **View Mode** | WrapContent |
| **Padding** | 0,0,0,0 |
| **Horizontal Alignment** | Left |
| **Vertical Alignment** | Top |
| **Size Mode** | Scaled |
| **Display Rows** | 0 |
| **Display Columns** | 0 |
| **Stretch** | Disabled |
| **Fixed Width** | 200 ignore because **Size Mode** is set to Scaled |
| **Fixed Height** | 300 ignore because **Size Mode** is set to Scaled |

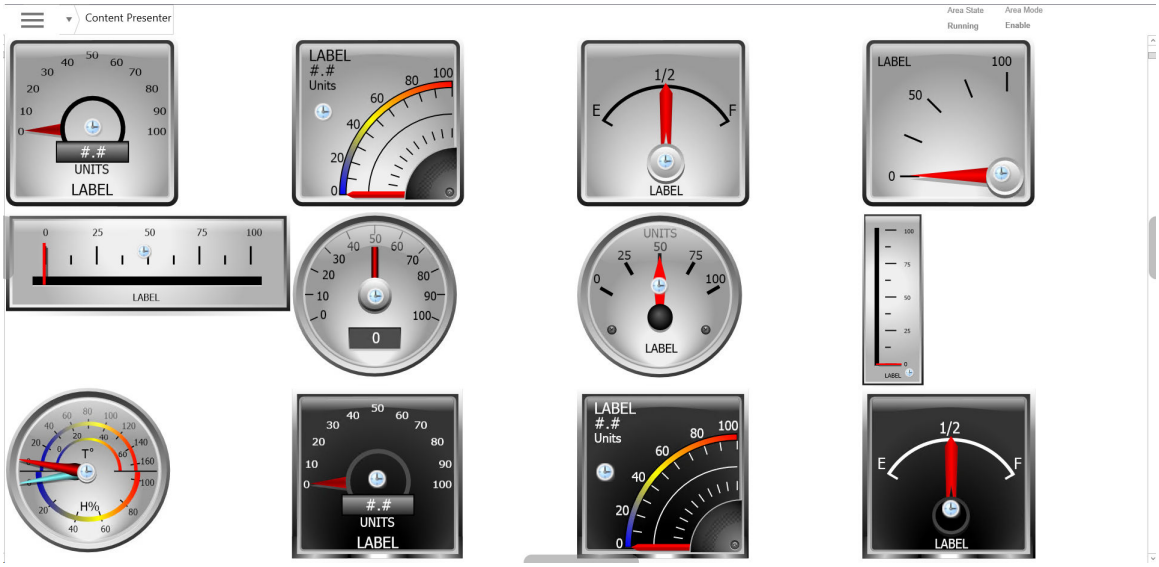
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




## Wrapped Horizontal List With Multiple Rows and Columns

| Properties | Assigned Values |
|---|---|
| **Fill** | Horizontal |
| **View Mode** | WrapContent |
| **Padding** | 0,0,0,0 |
| **Horizontal Alignment** | Left |
| **Vertical Alignment** | Top |
| **Size Mode** | Scaled |
| **Display Rows** | 3 |
| **Display Columns** | 4 |
| **Stretch** | Disabled |
| **Fixed Width** | 200 ignore because **Size Mode** is set to Scaled |
| **Fixed Height** | 300 ignore because **Size Mode** is set to Scaled |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




Graphics are smaller because the view port window has been configured to show four columns and three rows of cells. Graphic size adjusts to the constraining horizontal or vertical dimension of a cell while maintaining its original aspect ratio.

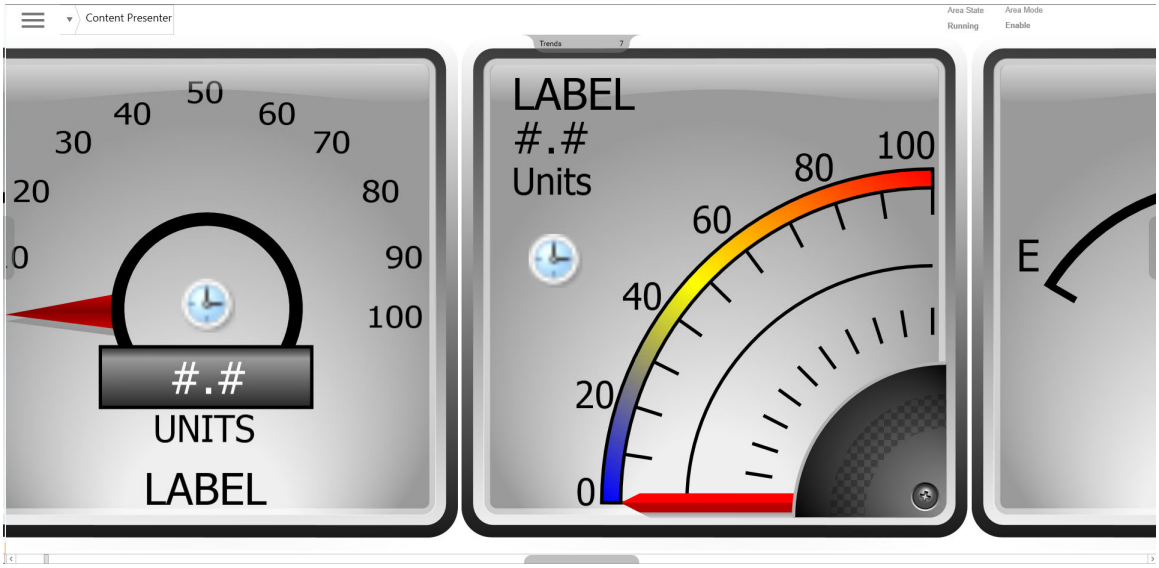
## Wrapped Vertical List and Vary the Number of Display Rows and Columns

The following examples show wrapped and scaled vertical lists of graphics when the number of displayed rows and columns vary.

### Wrapped Vertical List With No Specified Rows or Columns

| Properties | Assigned Values |
|---|---|
| **Fill** | Vertical |
| **View Mode** | WrapContent |
| **Padding** | 0,0,0,0 |
| **Horizontal Alignment** | Left |
| **Vertical Alignment** | Top |
| **Size Mode** | Scaled |
| **Display Rows** | 0 |
| **Display Columns** | 0 |
| **Stretch** | Disabled |
| **Fixed Width** | 200 ignore because **Size Mode** is set to Scaled |
| **Fixed Height** | 300 ignore because **Size Mode** is set to Scaled |

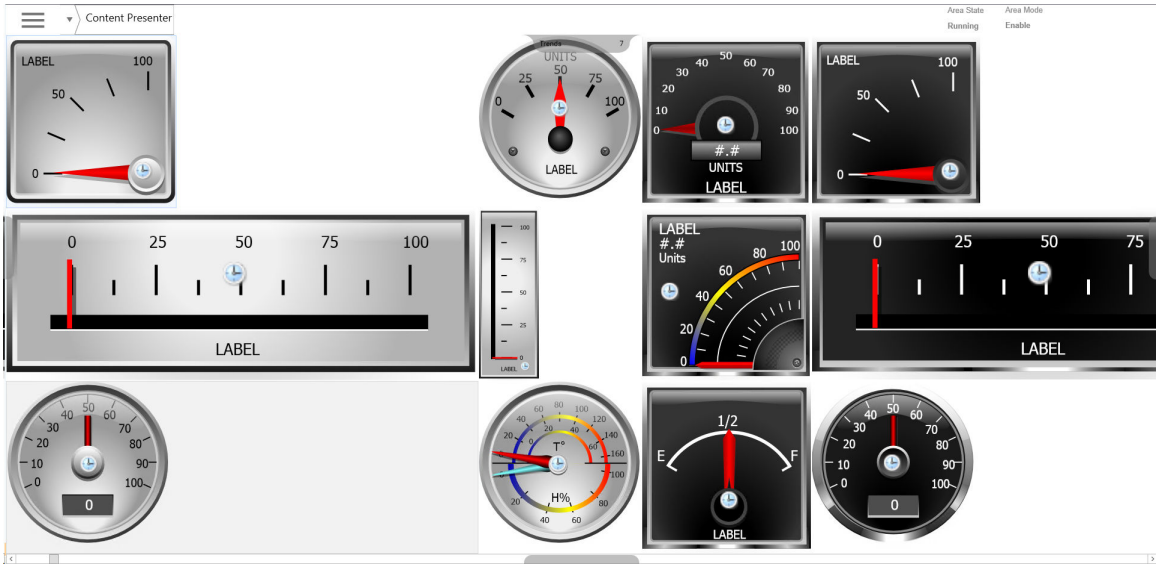
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




## Wrapped Vertical List With Multiple Rows and Columns

| Properties | Assigned Values |
|---|---|
| **Fill** | Vertical |
| **View Mode** | WrapContent |
| **Padding** | 0,0,0,0 |
| **Horizontal Alignment** | Left |
| **Vertical Alignment** | Top |
| **Size Mode** | Scaled |
| **Display Rows** | 3 |
| **Display Columns** | 4 |
| **Stretch** | Disabled |
| **Fixed Width** | 200 ignore because **Size Mode** is set to Scaled |
| **Fixed Height** | 300 ignore because **Size Mode** is set to Scaled |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




Cells are listed in vertical order by four columns and three rows. Graphic size adjusts to the constraining horizontal or vertical dimension of a cell while maintaining its original aspect ratio.

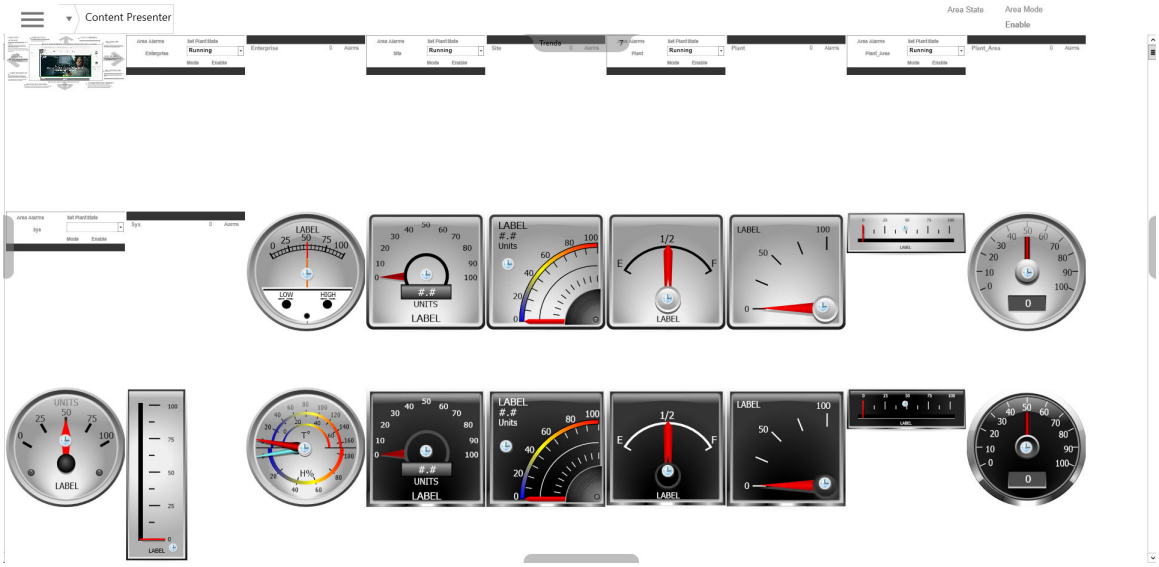
## Wrapped Horizontal List with Fixed Size Cells and Vary the Number of Rows and Columns

The following examples show wrapped and horizontal lists of graphics in fixed size cells when the number of displayed rows and columns vary.

### Wrapped Horizontal List With a Fixed Cell Size and No Specified Rows or Columns

| Properties | Assigned Values |
|---|---|
| **Fill** | Horizontal |
| **View Mode** | WrapContent |
| **Padding** | 0,0,0,0 |
| **Horizontal Alignment** | Left |
| **Vertical Alignment** | Top |
| **Size Mode** | Fixed |
| **Display Rows** | 0 |
| **Display Columns** | 0 |
| **Stretch** | Disabled |
| **Fixed Width** | 200 |
| **Fixed Height** | 300 |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




View port cells are arranged horizontally. When the next cell cannot fit within the view port area, the horizontal list wraps to the next row. Users shows rows outside of the view port using the vertical scroll bar.

## Wrapped Horizontal List With a Fixed Cell Size and Multiple Rows and Columns

| Properties | Assigned Values |
|---|---|
| **Fill** | Horizontal |
| **View Mode** | WrapContent |
| **Padding** | 0,0,0,0 |
| **Horizontal Alignment** | Left |
| **Vertical Alignment** | Top |
| **Size Mode** | Fixed |
| **Display Rows** | 3 |
| **Display Columns** | 4 |
| **Stretch** | Disabled |
| **Fixed Width** | 200 |
| **Fixed Height** | 300 |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

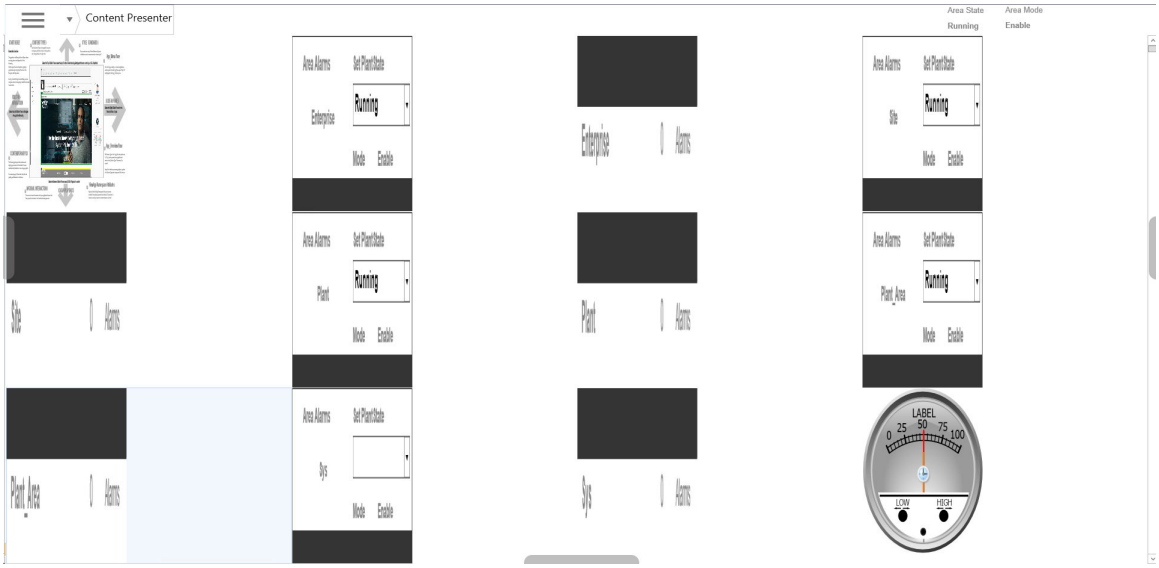



Graphics are placed in fixed size view port cells. Graphics are arranged in the view port horizontally in four columns and three rows.

## Wrapped Horizontal List With Scaled Graphics in Stretch Mode

| Properties | Assigned Values |
|---|---|
| **Fill** | Horizontal |
| **View Mode** | WrapContent |
| **Padding** | 0,0,0,0 |
| **Horizontal Alignment** | Left |
| **Vertical Alignment** | Top |
| **Size Mode** | Fixed |
| **Display Rows** | 3 |
| **Display Columns** | 4 |
| **Stretch** | Enabled |
| **Fixed Width** | 200 |
| **Fixed Height** | 300 |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




Graphics are placed in fixed size view port cells and stretched in their non-constrained dimension to completely fill the cell. The aspect ratio of each graphic is ignored.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Upgrade and Migration of the ContentPresenter App

The ContentPresenter app has been updated for the AVEVA System Platform 2023 release. The following new properties were added to normalize navigation and search behavior with other AVEVA OMI apps:

- **Search Child Levels:** This property lets you specify how many child levels down in the hierarchy from the current level are searched. Options are Unconfigured, All, OneLevel, TwoLevels, and ThreeLevels. The default is **Unconfigured**, which allows a migrated app to maintain its existing behavior by using deprecated properties options to determine how the search is conducted. This property only has meaning if **Navigation Search Options** has **ChildLevels** enabled.
- **Navigation Search Options:** This property lets you specify how searches within the app should begin, and what nodes should be included in the search. Options are Unconfigured, StartNode, Siblings, and ChildLevels. The default is **Unconfigured,** which allows a migrated app to maintain its existing behavior by using deprecated properties options to determine how the search is conducted. Multiple options can be enabled. Thus, to allow a search across the three child levels of the hierarchy from the search start point plus the start point and its siblings, you would enable ThreeLevels for the **Search Child Levels** property, and enable StartNode, Siblings, and ChildLevels for the **Navigation Search Options** property.

The following existing properties were deprecated. The deprecated properties are maintained to ensure backward compatibility with prior releases, and are now listed under the property category "Legacy Properties."

- **Search Levels:** This property is only used by the app if **Search Child Level** and **Navigation Search Options** are left in their default **Unconfigured** state. The default remains as **All**.
- **Navigation Search Mode:** This property is only used by the app if **Search Child Level** and **Navigation Search Options** are left in their default **Unconfigured** state. The default remains as **FixedLocation**.

The ContentPresenter app can be migrated to subsequent versions of System Platform as they become available.

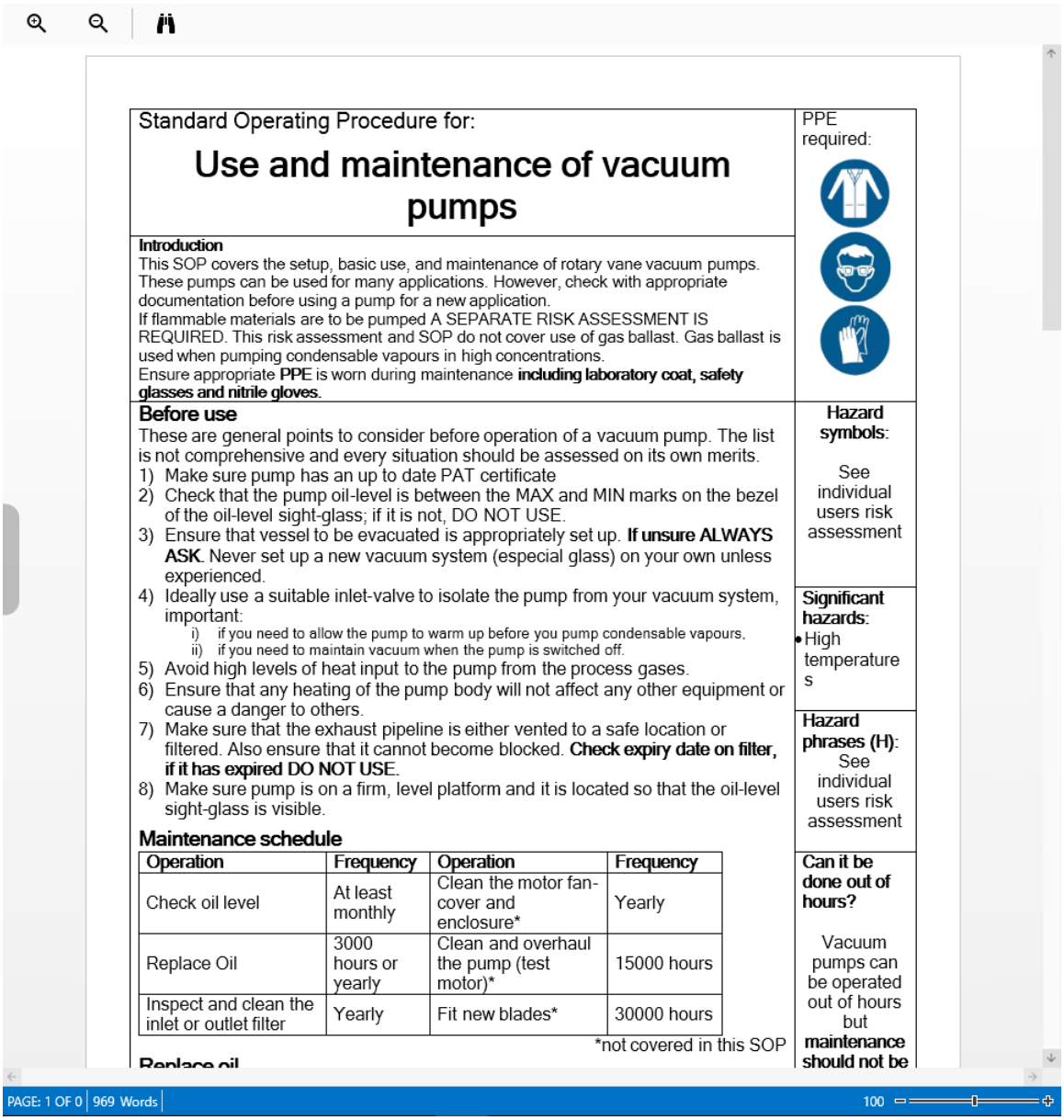
You can export the ContentPresenter app to an .aaPKG file and then import the aaPKG file into a future release of System Platform.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Chapter 3 DocViewerApp

The DocViewerApp shows a Word document within a pane of a ViewApp while a ViewApp is running or displayed in preview mode. The DocViewerApp initially shows the first page of the document at 100 percent zoom scale.

The DocViewerApp provides functionality similar to viewing a Word document in read-only mode. A document can searched and the document view can be enlarged or reduced in size. But, no permanent editing changes can be made to a Word document while displayed by the DocViewerApp.



Standard Operating Procedure for:

**Use and maintenance of vacuum pumps**

PPE required:

**Introduction**

This SOP covers the setup, basic use, and maintenance of rotary vane vacuum pumps. These pumps can be used for many applications. However, check with appropriate documentation before using a pump for a new application.
If flammable materials are to be pumped A SEPARATE RISK ASSESSMENT IS REQUIRED. This risk assessment and SOP do not cover use of gas ballast. Gas ballast is used when pumping condensable vapours in high concentrations.
Ensure appropriate **PPE** is worn during maintenance **including laboratory coat, safety glasses and nitrile gloves.**

**Before use**

These are general points to consider before operation of a vacuum pump. The list is not comprehensive and every situation should be assessed on its own merits.

1) Make sure pump has an up to date PAT certificate
2) Check that the pump oil-level is between the MAX and MIN marks on the bezel of the oil-level sight-glass; if it is not, DO NOT USE.
3) Ensure that vessel to be evacuated is appropriately set up. **If unsure ALWAYS ASK**. Never set up a new vacuum system (especial glass) on your own unless experienced.
4) Ideally use a suitable inlet-valve to isolate the pump from your vacuum system, important:
   i) if you need to allow the pump to warm up before you pump condensable vapours.
   ii) if you need to maintain vacuum when the pump is switched off.
5) Avoid high levels of heat input to the pump from the process gases.
6) Ensure that any heating of the pump body will not affect any other equipment or cause a danger to others.
7) Make sure that the exhaust pipeline is either vented to a safe location or filtered. Also ensure that it cannot become blocked. **Check expiry date on filter, if it has expired DO NOT USE.**
8) Make sure pump is on a firm, level platform and it is located so that the oil-level sight-glass is visible.

**Maintenance schedule**

| Operation | Frequency | Operation | Frequency |
|---|---|---|---|
| Check oil level | At least monthly | Clean the motor fan-cover and enclosure* | Yearly |
| Replace Oil | 3000 hours or yearly | Clean and overhaul the pump (test motor)* | 15000 hours |
| Inspect and clean the inlet or outlet filter | Yearly | Fit new blades* | 30000 hours |

*not covered in this SOP

**Replace oil**

**Hazard symbols:**

See individual users risk assessment

**Significant hazards:**

- High temperatures

**Hazard phrases (H):**

See individual users risk assessment

**Can it be done out of hours?**

Vacuum pumps can be operated out of hours but **maintenance should not be**

PAGE: 1 OF 0 | 969 Words | 100

The DocViewerApp includes a set of visual controls that appear in the command bar above the displayed document. These controls can be used to change the zoom level of a document while it is being displayed and search for a word or phrase within the document.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.



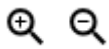
The DocViewerApp also includes a slider zoom control in the status bar beneath the displayed document. Moving the slider left or right zooms the document view in or out.




## Change the Zoom Level of a Document

The DocViewerApp provides several methods to set the zoom level of a document page shown in preview mode or a running ViewApp. A page can be zoomed out to a minimum of nine percent of its original size and zoomed in to a maximum of 500 percent.

- Zoom in and zoom out controls

  These controls appear above the displayed document on the menu bar. Each time the user selects a zoom in or zoom out control, the view magnification increases or decreases by ten percent.

- Zoom slider control

  The slider control appears beneath the displayed document on the status bar. Moving the slider right or left increases or decreases the magnification of the document view.

  Users can also select the **+** or **-** controls at the ends of the slider. Each press of the **+** control increments magnification of a document by10 percent. Each press of the **-** control decrements magnification of a document by 10 percent.

## Touch Support

The DocViewerApp supports single finger gestures on touch screens or portable devices.

- A Word document can be swiped or flicked vertically to show the previous or next pages of a document.
- A single finger tap can be used to select the visual icons shown within the viewer window of the DocViewerApp.

See Optimize the DocViewerApp for a Touch Device for instructions to enlarge the size of the visual icons to make it easier to select them while using touch gestures.

### Optimize the DocViewerApp for a Touch Device

The visual icons shown within the viewer window of the DocViewerApp can be enlarged to make them easier to select on touch screens or portable devices.

The following screen captures show the default size of the DocViewerApp's visual icons and their size after they have been enlarged for touch. AVEVA OMI includes the OptimizeForTouch Boolean attribute that belongs to the MyViewApp.Settings namespace. The default value of OptimizeForTouch is false. When OptimizeForTouch is set to true, the icons are enlarged.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| OptimizeForTouch Attribute Value | Icon Size | Example Icons |
|---|---|---|
| MyViewApp.Settings.OptimizeForTouch= False | Regular Size (Non-Touch) |  |
| MyViewApp.Settings.OptimizeForTouch= True | Optimized for Touch |  |

A common way to dynamically adjust the size of the visual icons in a running ViewApp is to place a graphic element like a button on a pane and then associate user input animation to toggle the state of the OptimizeForTouch attribute.

## Compatibility of the DocViewerApp

The DocViewerApp includes compatibility with current and future versions of System Platform.

- The DocViewerApp package must be installed on a computer running System Platform 2017 Update 3. The DocViewerApp cannot be installed on any other version of System Platform except Update 3.
- After the DocViewerApp is installed on a System Platform 2017 Update 3 system, the DocViewerApp will be able to migrate to future versions of System Platform InTouch OMI when they become available.

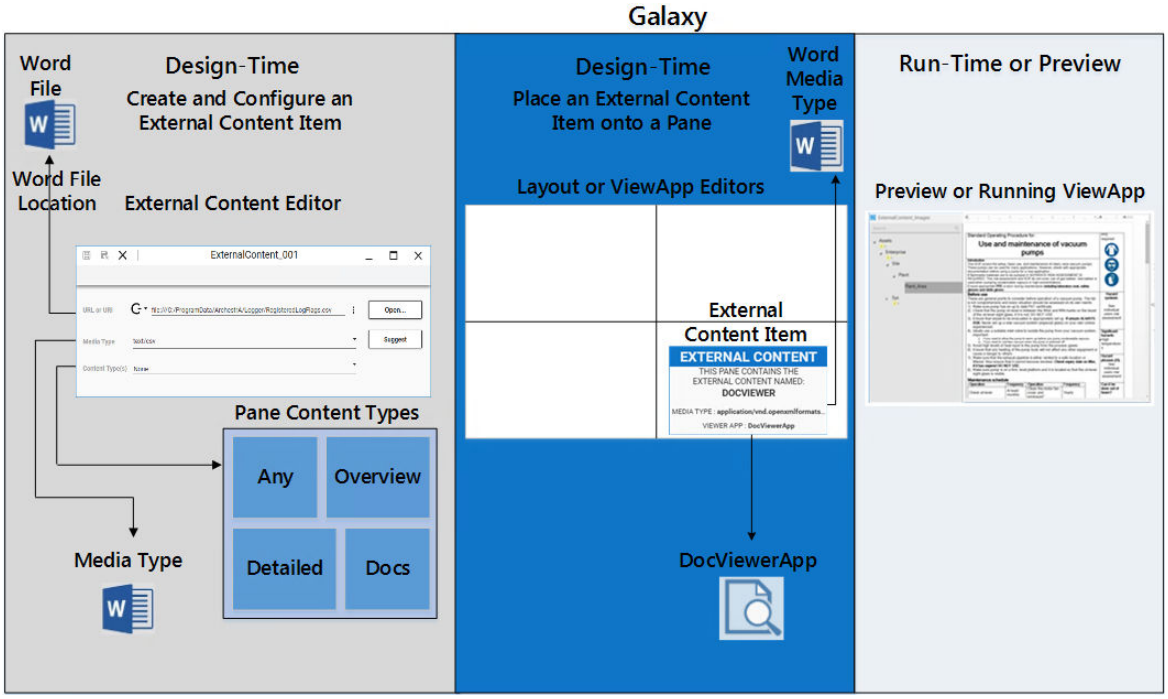
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Configure the DocViewerApp to Show Word Documents

The following figure summarizes using an External Content item to point to a remote computer containing a Word document. An External Content item is configured during design time to identify the location of the Word document and its media type.

**Note**: The DocViewerApp itself is not configured to show a Word document in a ViewApp.

The External Content item is associated with an asset or a user defined object. The asset or object is selected from the **Toolbox** and placed onto a layout pane. During runtime, the user selects an asset associated with a navigation item to view training procedures described in the Word document.




The major steps to implement the DocViewerApp to show Word documents in a ViewApp are summarized in the following list:

1. Place a Word document on a computer accessible from your Galaxy.
2. Create an External Content item.
3. Configure the External Content item that identifies the location and media type of the Word document.
4. Associate an External Content item to a graphic or object.
5. Place an asset or graphic on a ViewApp pane associated with the External Content item.

## Before You Begin

Before starting the steps to configure an External Content item, ensure the following prerequisites have been met:

- If you are placing the Word document on a remote computer in your network, ensure connectivity between the computer where the ViewApp will run and the computer where the remote Word document has been saved.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

Mapping a network drive is a typical way to connect to a remote computer hosting documents that you want show in a running ViewApp. For this configuration to work successfully, it is important that the computer to which the ViewApp is launched from has the same drive letter mapped to a location having the referenced document.

The DocViewerApp shows an error message to the user if the specified URI connection to the Word file is bad. For more information about the error message, see DocViewerApp Error Message.

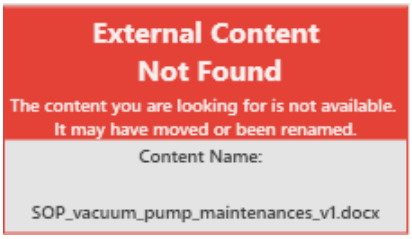
- Save the Word document in the presentation format that you want to display in the DocViewApp.

  Typically, you want to format the Word document in its intended final form without showing any revision markup.

**Important**: The DocViewerApp supports both the legacy .doc Word file type and the current docx file type.

### DocViewerApp Error Message

An External Content item includes an **URL or URI** option to specify the location of the Word file to be shown by the DocViewerApp during runtime or in preview mode. The specified location of the file must be complete and accurate. If the file is moved, deleted, or renamed, the DocViewerApp shows an error message to the user during runtime, but the ViewApp continues to run.




## Create an External Content Item

You create an External Content item from the Visualization folder of the System Platform IDE. Initially, the External Content item defaults to a set of values that can be changed using the External Content editor.

### To create an External Content item

1. Open the IDE and select the **Visualization** tab.
2. Select a folder within the **Visualization** folder if you want to create a new External Content item at a specific location.
3. On the **Home** ribbon, in the **Create** area, select **External content**.

   You can also create an External Content item by other methods:

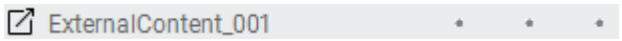
   - **Keyboard Shortcut**

     Press Ctrl + Shift + C

   - **Shortcut Menu**

     Right-click a folder of the **Visualization** folder to show a shortcut menu. Select the **New** option, and then select **External Content**.

   A new **External Content** item is created in the **Visualization** folder**.**




© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

The name of the new item follows a default naming convention of appending a three-digit number to the word ExternalContent.

4. Rename the External Content item.

After you create an External Content item, it must be configured to specify the remote location of the content and its media type.

## Configure an External Content Item

Each External Content item has three properties that must be assigned values:

- **URL or URI**
- **Media Type**
- **Content Type(s)**

An External Content item is modified from the External Content editor. The editor can be opened by double-clicking on an item from the Visualization folder. Also, an External Content item that has been placed onto a layout pane can be edited from the Layout and ViewApp editors by the selecting the item from the Actions list.

### To configure an External Content Item

1. Open the IDE and select the **Visualization** folder to show the External Content items available in the Galaxy.
2. Double-click an External Content item to open it in the External Content editor.

   For more information about each field in an External Content item, see Details of the External Content Editor.
3. Enter a URI string where the Word document is saved.

   The value you enter is the location of the Word file specified by a URI-formatted string. A media location must be specified.

   You can browse for the Word file by selecting the vertical dots icon to the right of the data entry field. A drop-down list includes a **Browse for file** option that enables you to browse your network and select a media file. The **URL or URI** field updates and shows a formatted URI path to the file.

   See More Information About Specifying a URI, More Information About Specifying a URI, More Information About Specifying a URI, More Information About Specifying a URI for information about the format of a URI string.
4. If you want, select the **Open** button to validate the URI you entered.

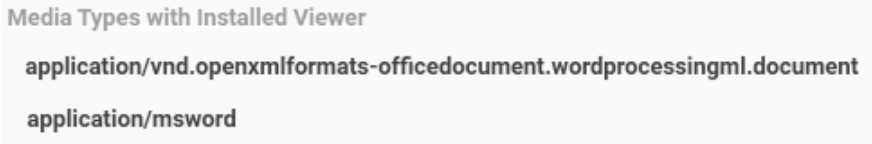
   The **Open** button launches the appropriate application associated with the doc or docx file types, which is usually Word.
5. Select the type of media associated with Word documents from the drop-down list of the **Media Type** field.

   The value you enter is the MIME type of a Word document. The DocViewerApp provides two Word MIME types, as shown in the following screen capture.

   - The application/msword Media Type is for legacy .doc Word files.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- The application/vnd.openformats-officedocument.wordprocessingml.document Media Type is for .docx Word files.

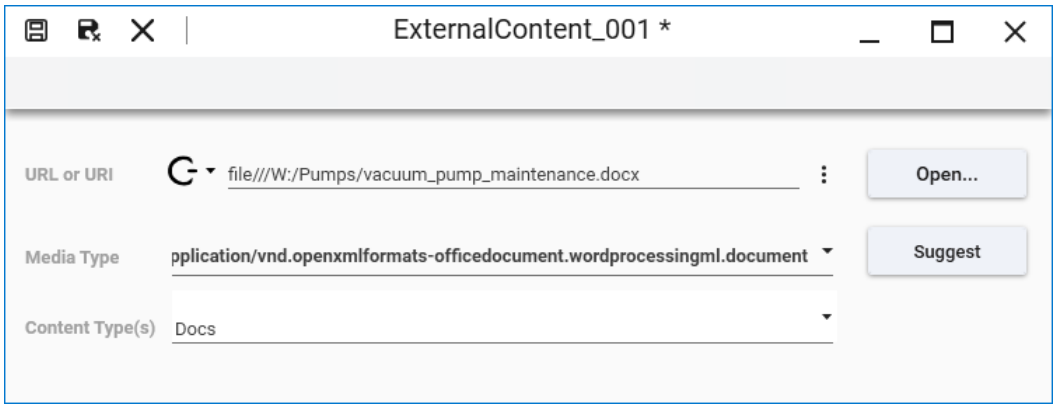



See More Information About Media Types, More Information About Media Types, More Information About Media Types, More Information About Media Types for information about supported media types.

6. Select the type of content from the drop-down list of the **Content Type(s)** field.

   The value you enter is used by content-placement algorithms within AVEVA OMI during run time to determine the placement of content when AutoFill or ShowContent calls are invoked.

   The configured External Content item for a Word document should look like the following screen capture.




7. Save your changes and exit from the External Content item.

## Link an External Content Item to an Object or Template

There are three ways to integrate an External Content in a ViewApp.

- Associate an External Content item to an object template, which is described in the following procedure
- Associate an External Content item to a custom navigation item that appears in the navigation model of the ViewApp.
- Place the External Content item on a layout pane, which is the simplest way and is described in Associate an External Content Item to a ViewApp.

### To link an External Content item to an object template

After you have created and configured an External Content item, you can link it to an object template. External Content items can be linked only to objects as opposed to graphics, which can be linked to or owned by an object. All External Content items reside in the Visualization folder. A single External Content item can be linked to multiple objects.

1. Open an object template in the **Object Editor**.
2. Select the **Attributes** tab.
3. In the **Content** pane, select the **Link Content** button.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

The Galaxy Browser opens.

4. Navigate to the folder that contains the **External Content** item to be linked.
5. Select the item, then click **OK**.

   The item is added to the object and appears in the **Content** tab.

   **Note:** After linking an External Content item, you can modify it by selecting it and then pressing the **Edit** button. However, any changes you make will apply to all objects that link to the item.
6. Save your editing changes to the object template and exit from the Object Editor.
7. Create an instance of the of the linked object template.
8. Create a layout which contains pane with a Content Type that matches the content type of the External Content item.
9. Add a navigation tree to the layout
10. Create a ViewApp that incorporates the layout.
11. Deploy the ViewApp.

    In runtime, navigate to the object or any instance created from the template. External Content item will auto-fill the matching pane to show the external content.

## Associate an External Content Item to a ViewApp

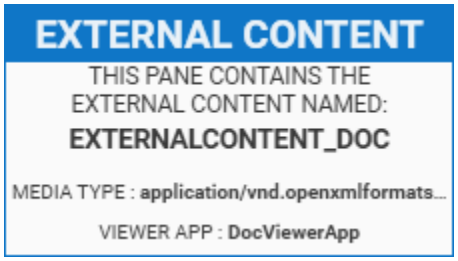
You can place an External Content item directly onto a pane from either the Layout or ViewApp editors . External Content items are listed in the **Toolbox** or **Assets** tabs of either editor.

### To associate external content to a ViewApp

1. Open the System Platform IDE and select the **Visualization** folder to see the list of layouts.
2. Select a layout that you want to insert external content and open it in the Layout editor.
3. Select the **Toolbox** tab of the Layout editor to show the list of content accessible from the Galaxy.
4. Locate the External Content item you want to place in the layout you selected.

   External Content thumbnails appear beneath of the list of content shown in the **Toolbox** list.
5. Select an External Content thumbnail from the **Toolbox** area, and then drag and drop it onto a pane of a layout incorporated into a ViewApp.

   The External Content thumbnail appears in the pane containing the name of the External Content item, the media type of the external content, and the viewer app that will display the media during runtime. Also, the layout **Actions** area shows the name of the External Content item and the pane that it was placed in.




© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

## Editing an External Content Item After It Is Placed on a Pane

An External Content item can be modified after being placed in a layout or a ViewApp, which automatically propagates the changes

### To edit an External Content item in a layout

1. If necessary, open the layout containing the External Content item.
2. Select the **Options** icon to the right of the item in the **Actions** list.

   A drop-down list shows an **Edit External Content** command.
3. Select **Edit**.

   The External Content editor opens the item for editing.
4. Update the values assigned to the item and save your changes.

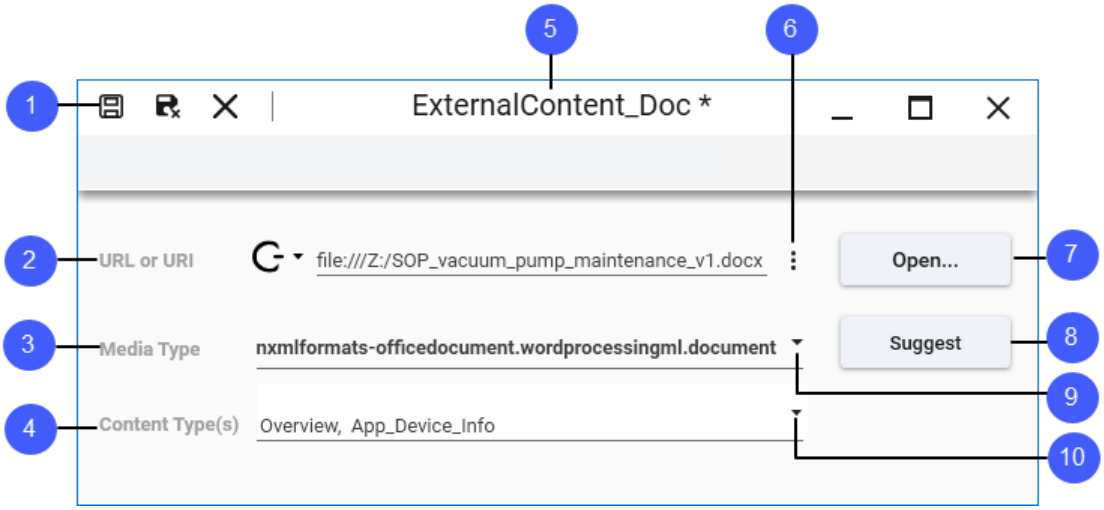
   The External Content thumbnail placed in a pane updates to reflect the changes made to the item.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Details of the External Content Editor

You use the External Content editor to configure an External Content item for a document. Before you configure an External Content item, you must know:

- Network location of a document
- Media type of the document
- Content type(s) of the layout pane that will host the External Content item




| | |
|---|---|
| 1 | Commands to save, save and close, and close the External Content editor. |
| 2 | URL or URI that specifies the location of external media using a standard format. See More Information About Specifying a URI, More Information About Specifying a URI, More Information About Specifying a URI, More Information About Specifying a URI for the format of a URI or URL<br>A warning message appears if the document cannot be located during runtime. |
| 3 | A media type is a two-part identifier that specifies the type of application required to process or view remote content. A media type can be entered in the field or selected from a drop-down list. See More Information About Media Types, More Information About Media Types, More Information About Media Types, More Information About Media Types for the format of a Media type value.<br>A warning message appears if a media type is specified that does not have an associated viewer application. |
| 4 | Content type assigned to the external media that enables ViewApp algorithms to place content in specific panes during runtime. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| 5 | Name of the External Content item. |
| 6 | Drop-down list with options to browse for an external content file or specify a URL using HTTP or HTTPs. |
| 7 | Validates the location of external media specified in the **URL or URI** field. An attempt is made to display the external media in an application assigned as the default by the operating system, not the app specified for the external content media type.<br>A warning message appears if the content cannot be found at the location specified in the **URL or URI** field. |
| 8 | **Suggest** is optional. When selected, it automatically selects a media type based on the entry in the **URL or URI** field. The entered value can be changed if the suggestion does not match the expected media type.<br>**Note**: Ensure the suggested media type is correct. The external media does not appear if the media type is incorrect. |
| 9 | Drop-down list of commonly used media types. Media types that have apps in the Galaxy capable of servicing them are shown in bold text. |
| 10 | Drop-down list of content types that can be used at preview\runtime to assign the external content to panes of a matching content type.<br>**Note**: None is not a content type. Instead, it simply means a content type has not been assigned to the pane. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

## More Information About Media Types

A media type is a standard two-part string analogous to a MIME type that identifies external content file types and their format. System Platform uses a media type to identify external content and the type of app required to display media during runtime.

A media type consists of a type and a subtype, which is further structured into a tree.

type "/" [tree "."] subtype ["+" suffix] *[";" parameter]

For more information about the format of media types, see https://www.iana.org/assignments/media-types/media-types.xhtml

System Platform provides several default media types that include associated apps to display media. The drop-down list of the **Media Type** field shows the default media types in bold text to indicate a viewer app is available in the Galaxy that can service external content with these media types. Other listed media types that appear in plain text require an app to be created and imported into a Galaxy to play the specified media.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# More Information About Specifying a URI

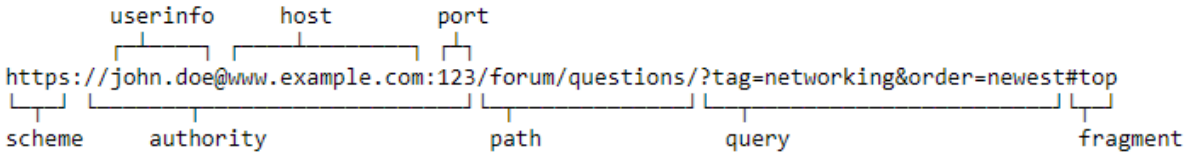
In the context of External Content, a Uniform Resource Identifier (URI) is a string that identifies the pathway to specific content that can appear in a running ViewApp.

All URIs adhere to predefined syntax rules.

- Generic URI syntax consists of a hierarchical sequence of components

  ```
  URI = scheme:[//authority]path[?query][#fragment]
  ```

  **Example**

- Each URI begins with a scheme name followed by a colon

  Examples of common scheme names include http:, https:, and file:

- An optional authority component preceded by two slashes (//)
  - Use information component consisting of a user name and optional password preceded by a colon followed by an at symbol (@)

    //username:password@

  - Host subcomponent consisting of a registered hostname or IP address
- A path component consisting of a sequence of path segments separated by a slash (/). A path is always defined for a URI, though the defined path may be empty
- An optional query component preceded by a question mark (?), containing a query string of non-hierarchical data.

For more information about the format of a URI, see https://tools.ietf.org/html/rfc3986

The following examples show common URIs that identify External Content within a Galaxy

- ftp://ftp.is.co.za/rfc/rfc1808.txt -- ftp scheme for File Transfer Protocol services
- file:///Z:/Media/Runtime%20Language%20Switching.mp4
- http://www.exampleserver.com/documents/index.html

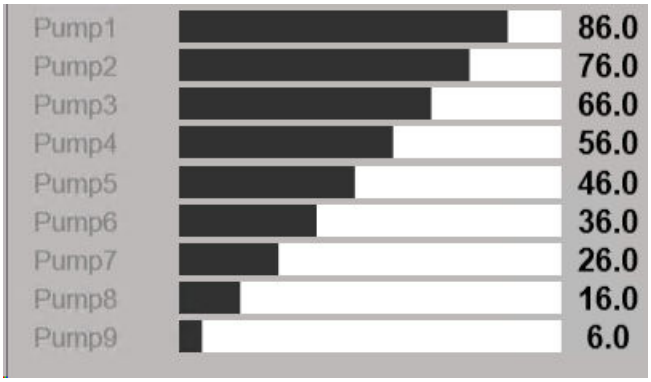
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Chapter 4 AVEVA Graphic Repeater OMI App

The AVEVA™ Graphic Repeater OMI App shows a graphic that is repeated multiple time based on custom properties assigned to different references. During runtime, the graphic appears in a repeatable list sorted by a single referenced custom property value common to each graphic in the list. Hereafter, the AVEVA™ Graphic Repeater OMI App is referred to as the Graphic Repeater app.

The Graphic Repeater app incorporates the functionality of the SetCustomPropertyValue() method API to change the expression or reference value of a repeatable graphic custom property. No user configuration of the method is required. For more information, see Changing the Expression or Reference of a Custom Property at Run Time in the *Application Server Help*.

The Graphic Repeater app is particularly useful for visualizing a common process value across multiple pieces of equipment simultaneously.The following figure shows the Graphic Repeater app displaying a common process value for a set of pumps.




## Visual and Functional Characteristics of the Graphic Repeater App

The Graphic Repeater app includes layout properties that modify the appearance of repeatable graphics during runtime and functional properties that filter and sort the list of repeatable graphics. For a complete list of properties that set visual and functional characteristics of the Graphic Repeater app, see Configure Graphic Repeater App Properties.

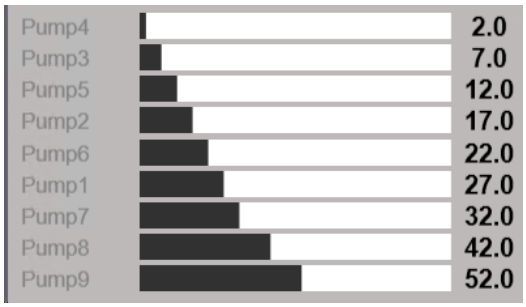
### Visual Characteristics

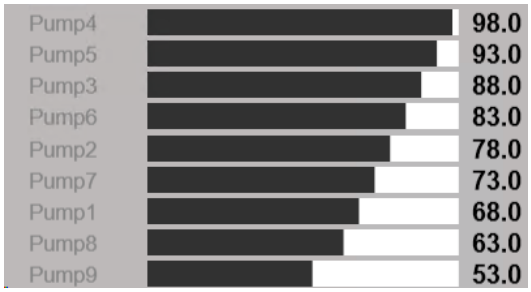
The Graphic Repeater app includes a **Layout** group of properties that determine the visual appearance of repeatable graphics during runtime.

The Graphic Repeater app includes the **Sort Order** property to arrange Repeatable graphics to appear in ascending or descending order based on the value of the custom property specified for the **Sort By** property.

| **Ascending Sort Order** | **Descending Sort Order** |
|---|---|

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

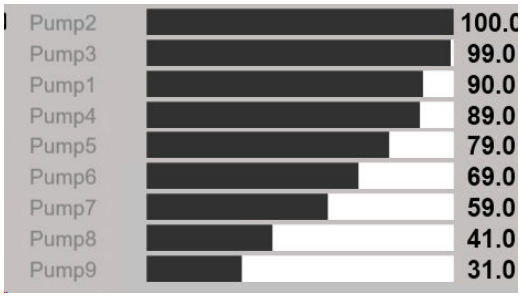


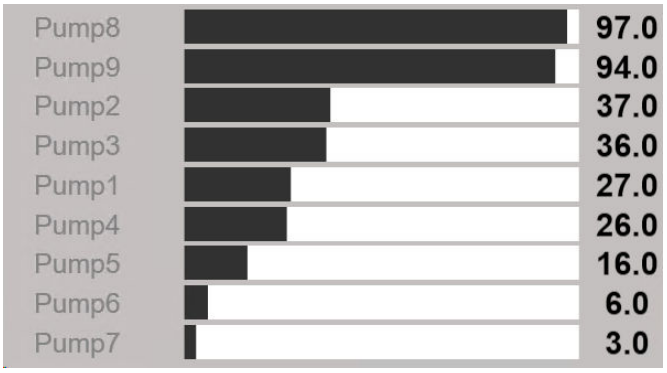

The size of the Graphic Repeater app shown during runtime is based on the size of the layout pane in which it has been placed. Changing the vertical or horizontal dimensions of a pane during runtime changes the size the app.

The following figures show how the Graphic Repeater app changes size by increasing the width and height of the pane in which it is placed. In these examples, the fill style of the repeatable graphics are arranged vertically.

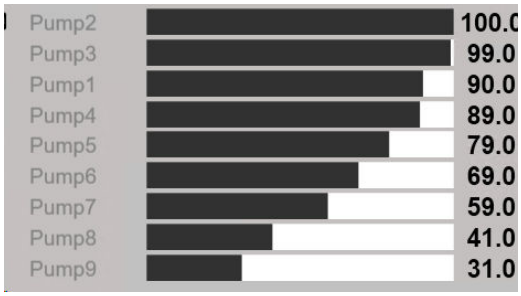
**Original Pane Size**



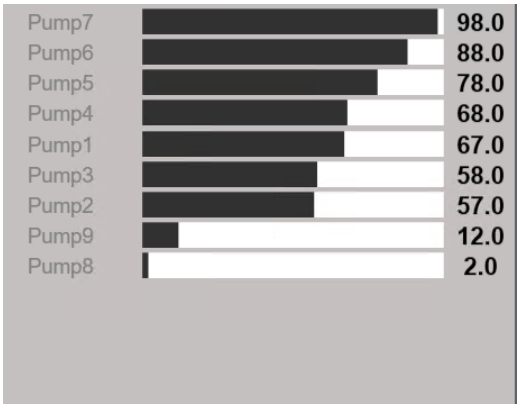

**Increasing the Width of the Pane**




**Original Pane Size**




**Increasing the Height of a Pane**




The Graphic Repeater app includes a **Fill Style** property, which includes options to arrange repeatable graphics horizontally or vertically. When **Fill Style** is set to vertical, repeatable graphic size adjusts to the width of the pane. When **Fill Style** is set to horizontal, repeatable graphic size adjusts to the height of the pane.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

Repeatable graphics can be shown in specified numbers of rows and columns by assigning values to the **Display Columns** and **Display Rows** properties. The following examples show repeatable graphics arranged in two columns and three rows.

However, the value of the **View Mode** property determines how the columns and rows appear in the pane.

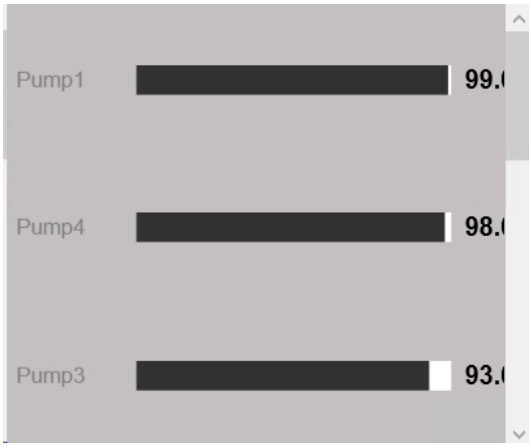
- **View Mode=ListContent**

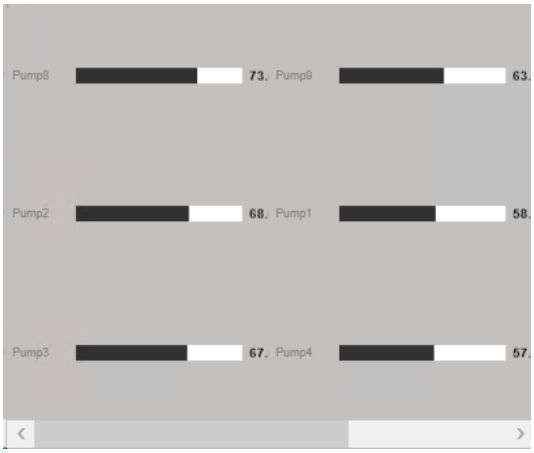
  Graphic items are shown in the Graphic Repeater app as a continuous sequential list. The Graphic Repeater app includes scroll bars to view graphics that extend beyond the bottom or right border of the pane.

- **View Mode =WrapContent**

  Repeating graphics are listed in the fill direction until a graphic does not fit within the border of the pane. The graphic then wraps to the next column or row within the pane.

**View Mode=LIst Content** **View Mode=WrapContent**



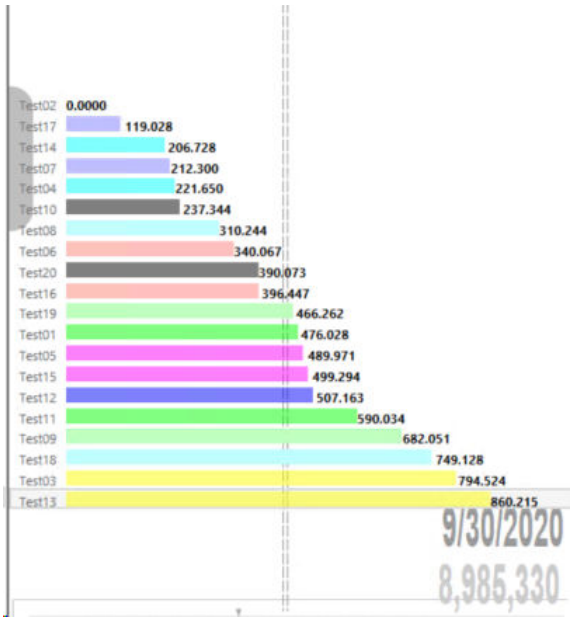

Scrollbars are included when repeatable graphics appear outside the pane. If the Graphic Repeater app runs on a touch monitor or smart phone, the pane can be scrolled horizontally or vertically with a flick gesture left and right or up and down.

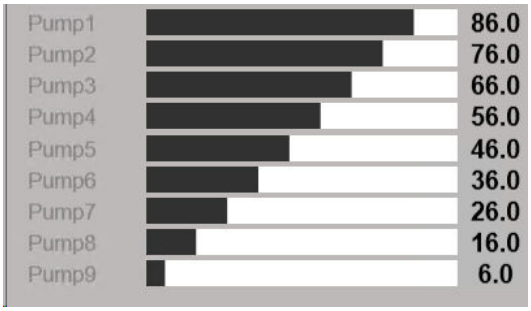
The Graphic Repeater app provides two properties to set a background behind the list of repeatable graphics during runtime.

- The **Background Graphic** property provides the capability to specify a graphic that is placed behind the repeatable graphic and serves as the background
- The **Background** property includes a color picker to set a background color that appears over the entire surface of the pane in which the Graphic Repeater app has been placed.

**Background Graphic Property** **Background Property**

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.



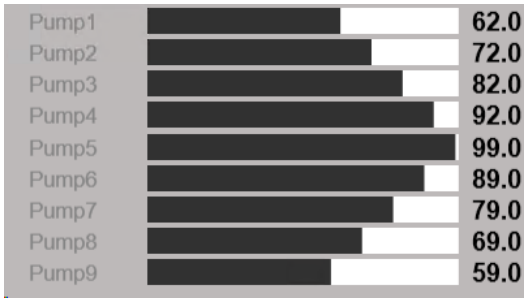

The background properties are not mutually exclusive. Both properties can be specified simultaneously for an instance of the Graphic Repeater app.

## Functional Characteristics

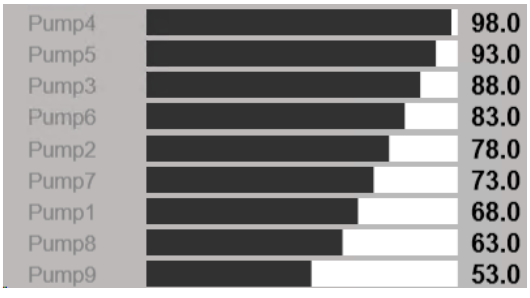
The Graphic Repeater app includes a **Sort** group of properties that determine if the list of repeatable graphics are sorted during runtime, their sort order, and if filtering is applied to show only a specified number of graphics with the highest or lowest values.

By default, the list of repeatable graphics is not sorted. Graphics appear by name order. Sorted graphics show repeatable graphics in order by lowest or highest values based on the value of the **Sort Order** property.

**Unsorted**




**Sorted**

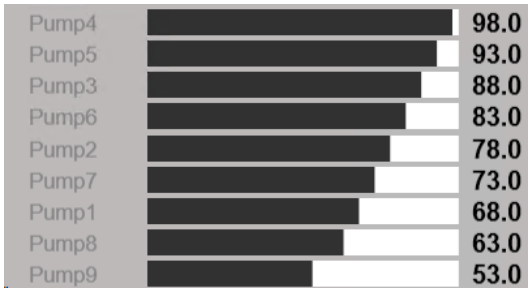


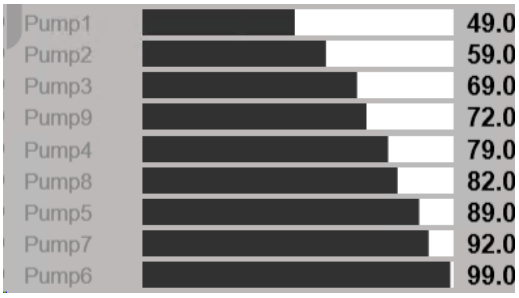

A descending list of repeatable graphics places the highest values at th top. An ascending sort order places the lowest values at the top.

**Descending Sort Order**

**Ascending Sort Order**

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




The repeatable list of graphics can be filtered to restrict the display to a specified number of graphics. Based on the sort order, a descending list shows the highest values. An ascending sort order shows the lowest values.

**Filter Top 4 in Descending Order**




**Filter Top 4 in Ascending Order**




© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Configure the Graphic Repeater App

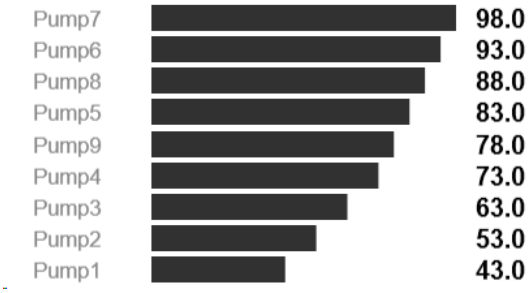
Preparing the Graphic Repeater app to run in an AVEVA ViewApp includes major workflows to create a repeatable graphic and configure the app's properties. The following section includes an example of preparing the Graphic Repeater app for use with an AVEVA OMI ViewApp. After that, Configure Graphic Repeater App Properties includes the details of assigning values to the app's configuration properties.

## Example of Building the Graphic Repeater App

Preparing the Graphic Repeater app to run in a ViewApp includes two major workflows of creating a repeatable graphic and assigning values to the app's properties. This topic provides a quick over view of the major steps in both workflows.

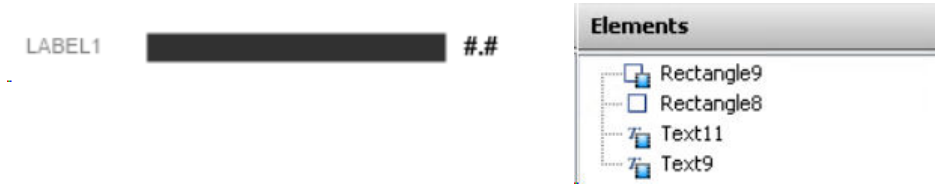
### Creating a Repeatable Graphic

The following figure shows a Graphic Repeater app running in a pane of a ViewApp. The repeatable graphic is a horizontal bar with a label on the left and the current value of a custom property on the right.



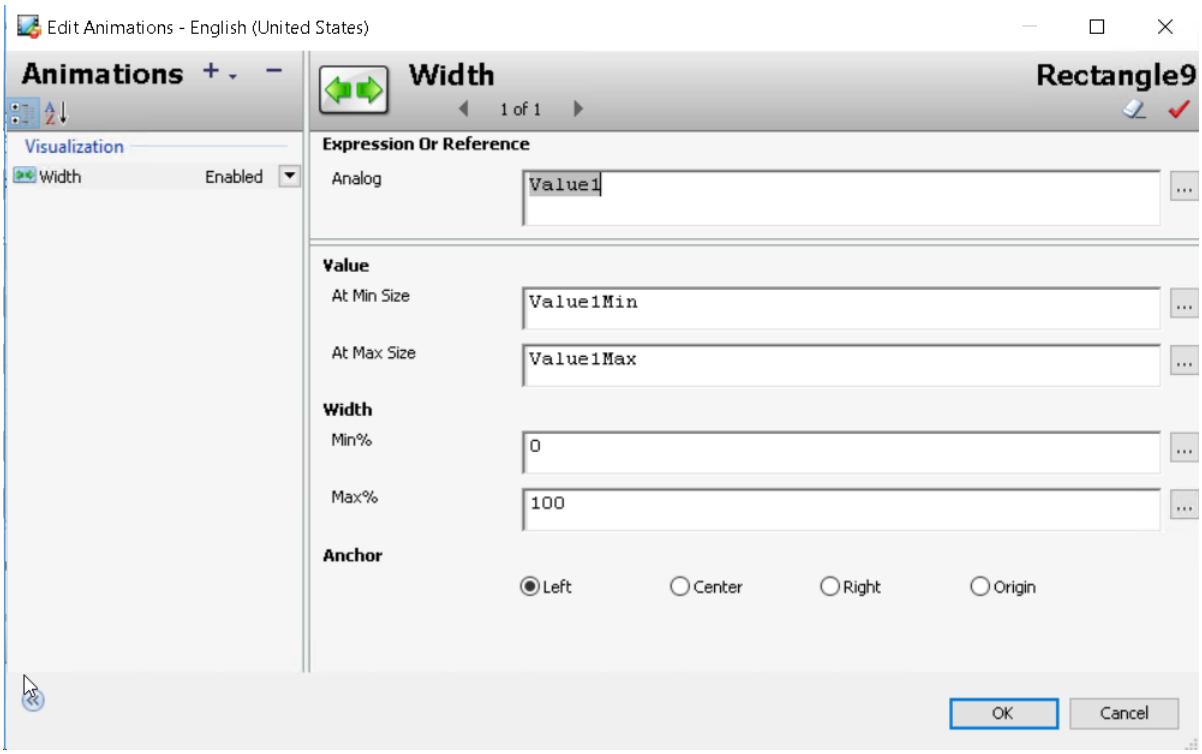

The Graphic Repeater app is configured to show graphics horizontally in descending order by the current values of each graphic. There are nine repeatable graphics shown by the app.

This is what the repeatable graphic looks like when it is open in the Industrial Graphic Editor. The graphic consists of two rectangle graphic elements and two text elements.



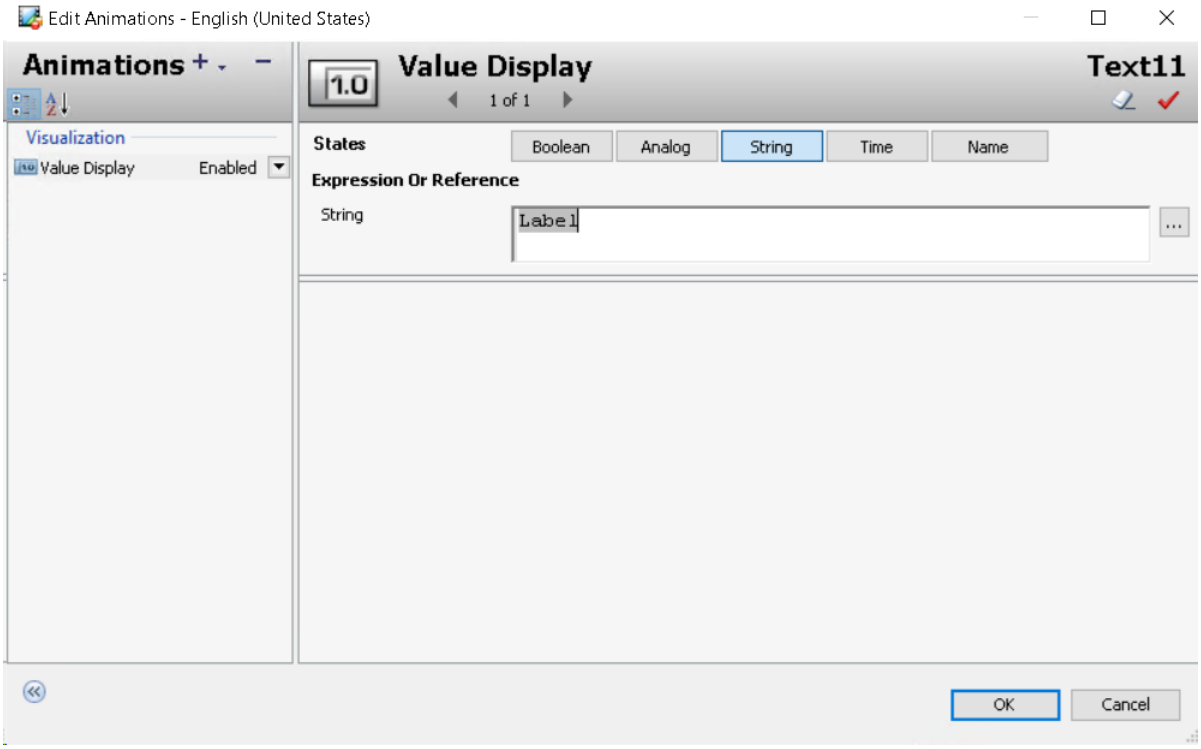

Width animation is set to custom property Value1for Rectangle9.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.



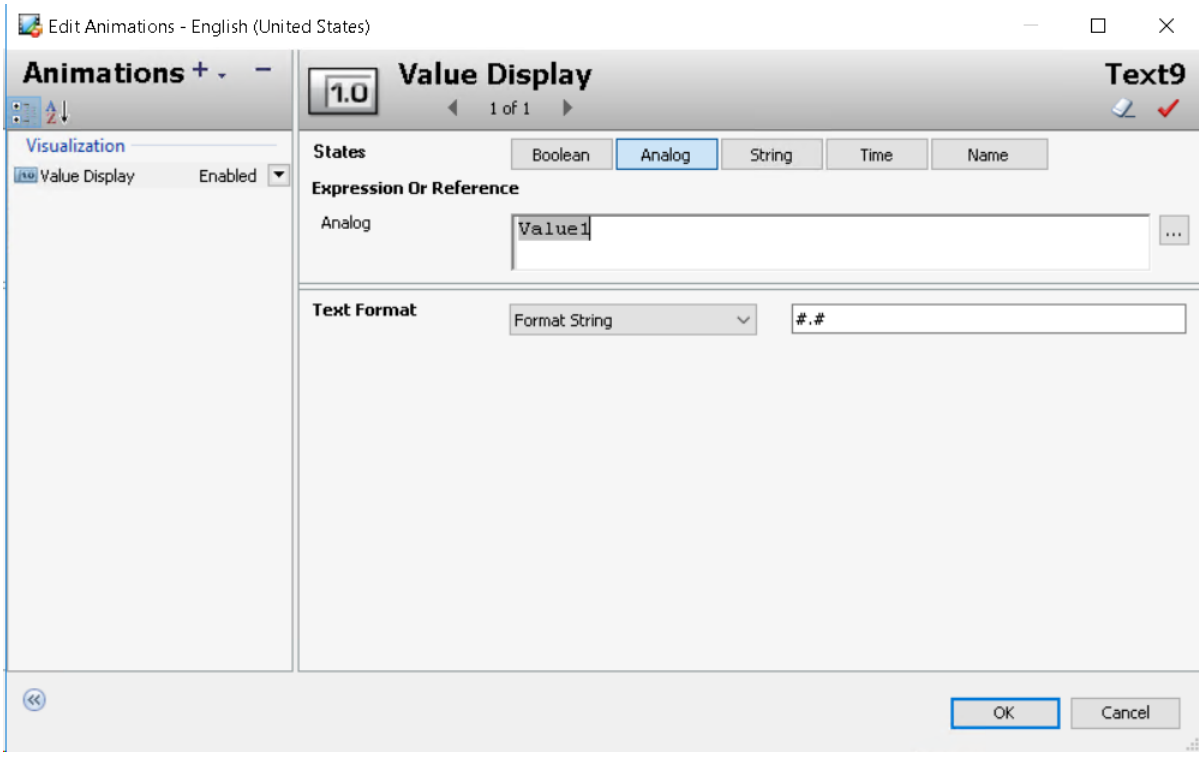

Rectangle8 has no assigned animation.

Text11 associates custom property Label1 to Value Display animation.




Text9 associates custom property Value1 to Value Display animation.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




The width of the repeatable graphic bar is determined by the current value of its Value1 custom property. A static string will be associated with the Label1 custom property of the Text11 graphic element.

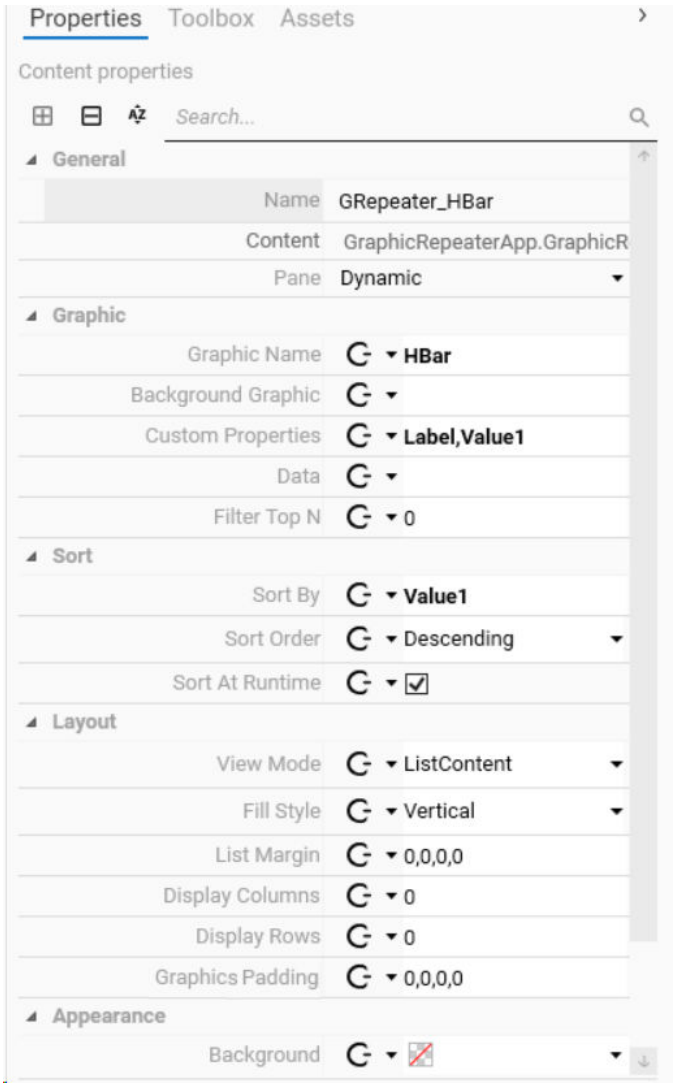
## Assigning Values to Graphic Repeater app Properties

The next section of the chapter describes the complete procedure to place the Graphic Repeater app onto a layout pane, and then assign values to properties.This section summarizes some of the major property configuration steps.

The following figure shows the values assigned to Graphic Repeater app properties for this example repeatable graphic.

- Label1 and Value1 are the custom properties of the HBar graphic.
- The repeatable graphics will be sorted by the current value of the Value1 custom property.
- The graphics will be oriented vertically and in descending order.
- The name of the instance of the Graphic Repeater app is GRrepeater_HBar.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




## Write a Layout Script

The following example layout script provides values to the Label1 and Value1 custom properties that belong to the HBar repeatable graphic.

The **Data** property associated with the GRepeater_HBar instance of the Graphic Repeater app assigns values to the Label1 and Value1 custom properties in their comma delimited order specified in the **Custom Properties** property. Label1 is assigned a static string enclosed in double quotation marks. Value 1 is assigned values by object references. The script assigns values to nine instances of the HBar graphic.

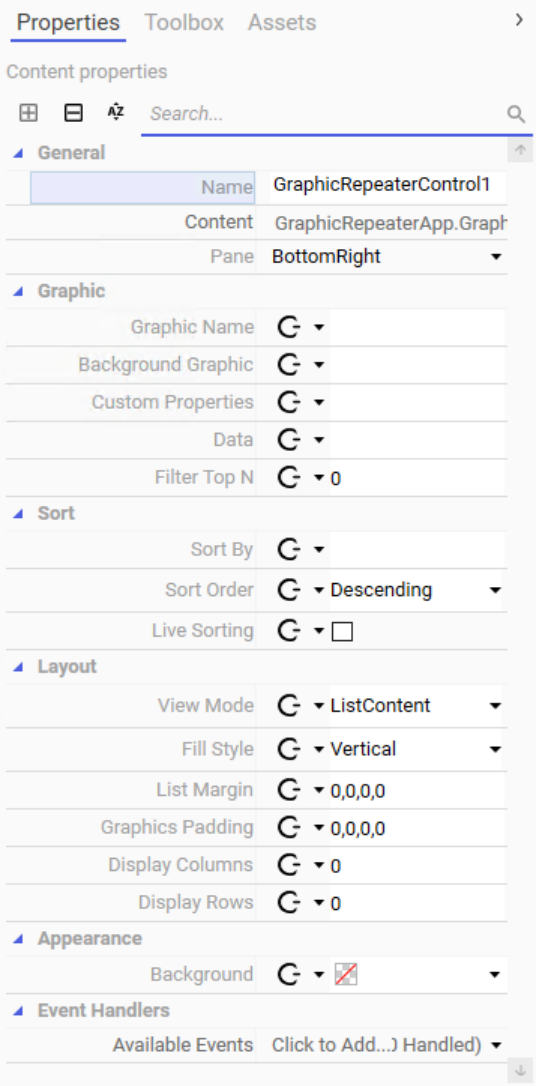
```
MyContent.GRepeater_HBar.Data = " ""Pump1"",PLCSim.Triangle1," +
                                " ""Pump2"",PLCSim.Triangle2," +
                                " ""Pump3"",PLCSim.Triangle3," +
                                " ""Pump4"",PLCSim.Triangle4,"+
                                " ""Pump5"",PLCSim.Triangle5," +
                                " ""Pump6"",PLCSim.Triangle6," +
                                " ""Pump7"",PLCSim.Triangle7," +
                                " ""Pump8"",PLCSim.Triangle8,"+
                                " ""Pump9"",PLCSim.Triangle9";
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

For more detail about layout scripts, see Example of a Layout Script with the Graphic Repeater App.

## Configure Graphic Repeater App Properties

Graphic Repeater app properties can be shown in the Layout or ViewApp editors by placing the Graphic Repeater app on a layout pane. After selecting the app on a pane, its properties appear on the **Properties** page by functional groups. The following figure shows the default property values after initially opening the app.



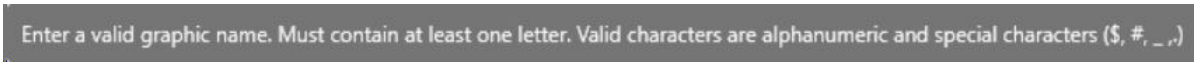

## Property Value Validation Checking

As you enter values for properties, the Graphic Repeater app validates the input of some properties. If an invalid input value is detected, a red rectangle appears around the data entry field.




Placing your mouse directly over the data entry field containing the invalid data shows a tooltip with more information about the invalid data.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




The table following the property configuration procedure includes a list of property value requirements for those properties whose input is validated by the Graphic Repeater app.

Further error checking occurs when the ViewApp containing a Graphic Repeater app is deployed and starts running. See Validity Checking During Runtime.

### To configure Graphic Repeater app properties

1. Open the Layout or ViewApp Editor and select the **Toolbox** tab.
2. Open the folder in the **Toolbox** where the Graphic Repeater app was placed when it was imported.
3. Select the Graphic Repeater app.
4. Drag and drop the Graphic Repeater app thumbnail onto a layout pane.
5. Select the Graphic Repeater app thumbnail and select the **Properties** tab.

   The **Properties** tab shows the properties of the Graphic Repeater app.

   The following table describes each property.
6. Assign values to properties and save your changes.

**Note**: The Graphic Repeater app can be shown in a preview session to quickly assess your property changes without deploying the ViewApp. A preview session launches immediately and runs the ViewApp containing the Graphic Repeater app in a separate window.

| Properties | Descriptions |
|---|---|

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| **Graphic Name** | Specifies the graphic to repeat by the app. If It is a graphic associated with an object, specify the name as *ObjectName.GraphicName.*<br><br>Embedded graphics are supported. In the following example, the *basesymbol* specified from the **Graphic Name** property contains *embedsymbol1*. The cpint custom property of the embedded graphic is specified as a custom property in the form *embedded_graphic_name.custom_property*<br><br>  <br><br>The number of repeatable graphics shown during runtime is based on the following formula:<br><br>`# graphics = # data groups / # custom properties`<br><br>**Property Value Requirements**<br><br>• A single graphic name must be assigned to the **Graphic Name** property. The **Graphic Name** property cannot be left blank.<br>• Graphic name must contain at least one alphanumeric character or special characters $, #, _, or a period (.).<br>• Graphic name cannot start with a dollar sign ($) or period (.)<br>• Graphic name cannot end with a period (.) or contain more than one period in the name. |
| **Background Name** | Specifies the name of an optional graphic to appear behind the repeating graphic list during runtime. The background graphic provides header and footer information for the app.<br><br>A background graphic stretches to fit the full width and height of the pane in which the Graphic Repeater app has been placed. Use the **List Margin** property to adjust the offset between the graphic list and the background graphic.<br><br>For more information about specifying a background for the Graphic Repeater app, see Details of Background Properties.<br><br>**Property Value Requirements**<br><br>Same as the **Graphic Name** property. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| **Custom Properties** | Specifies one or more custom properties that belong to the graphic specified by the **Graphic Name** property.<br><br>Multiple custom properties must be specified in a comma delimited list.<br><br>cp1,cp2,cp3<br><br>**Note:** Regardless of the regional setting of the computer, a comma is used as the data delimiter.<br><br>For more information about the rules of comma delimited data, see Details of Comma Delimited Data.<br><br>Custom properties specified by the **Custom Properties** property must match the corresponding **Data** values one to one in the list.<br><br>**Property Value Requirements**<br><br>• At least one custom property must be specified and the property cannot be left blank.<br>• Custom property names must contain at least one alphanumeric character or special characters $, #, _, or a period (.).<br>• Number of specified custom properties cannot exceed 20. |
| **Data** | A list of data references matched to custom properties in a comma delimited list that maps one to one with the custom properties list.<br><br>**Important**: If there is a mismatch between custom properties and data during runtime, the app will discard unmatched data points and an error message appears in the logger.<br><br>A data value can be a reference or a constant and can be modified during runtime. For more information about the **Data** property, see Details of the Data Property.<br><br>Client and layout scripts can be used to set data references for graphic custom properties.<br><br>**Property Value Requirements**<br><br>• Data values must be provided<br><br>For more information about the number of data points that can be shown by the Graphic Repeater app based on the value of the **Live Sorting** property, see Details of the Live Sorting Property.<br><br>• Passing data to custom properties using relative references (eg: Me.references) is not supported. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| **Filter Top N** | Filters the list of repeatable graphics shown during runtime to a specified number (*N*). The default is 0 to show all graphics.<br>**Property Value Requirements**<br>• *N* value must be an integer.<br>• The **Filter Top N** value must be less than or equal to the number of data points. If the **Filter Top N** value is greater than the number data points, then the **Filter Top N** value is ignored and all data points are shown without filtering. |
| **Sort By** | Specifies the name of a custom property whose current value is used to sort graphics during runtime based on the configured sort order.<br>For more information about sorting data, see Details of Sort Properties.<br>**Property Value Requirements**<br>Entered custom property name must match one of the graphic custom properties specified for the **Custom Properties** property. |
| **Sort Order** | Identifies the repeating graphics sort order: **Ascending** or **Descending** by custom property value. The default sort order is **Descending**. |
| **Live Sorting** | Boolean property to enable or disable graphics sorting at runtime. The default is false to disable sorting.<br>The **Live Sorting** property can be modifed during runtime to enable or disable graphic sorting.<br>For more information, see Details of the Live Sorting Property. |
| **View Mode** | Determines the organization of repeating graphics within a layout pane.<br>**ListContent**<br>Graphic items are shown in the Graphic Repeater app as a continuous sequential list. Based on the specified value of the **Fill Style** property, the sequential list is arranged in vertical or horizontal order. The default view mode.<br>When **View Mode** property is set to **ListContent**, the Graphic Repeater app includes scroll bars to view graphics that extend beyond the bottom or right border of the pane.<br>**WrapContent**<br>Repeating graphics are listed in the fill direction until a graphic does not fit within the border of the pane. The graphic then wraps to the next column or row within the pane. Scroll bars appear when the graphic item list extends beyond the pane borders.<br>When **View Mode** is set to **WrapContent**, repeating graphics appear on the next row or next column based on whether the **Fill Style** property value is Horizontal or Vertical. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| **Fill Style** | Options to set vertical or horizontal fill order of repeating graphics.<br>• **Horizontal** fill order is left to right within the pane.<br>• **Vertical** fill order is top to bottom within the pane. Vertical is the default.<br>For more information about graphic size based on the selected **Fill Style** options, see Details of the Fill Style Property. |
| **List Margin** | Specifies the pixel offset between a background graphic and the list of repeating graphics. The offset is specified as blank space padding on the left, top, right, and bottom of the reference repeating graphic.<br>**List Margin** values are specified in a comma delimited ordinal list of integers as Left,Top,Right,Bottom.<br>0,0,0,0 is the default, which does not include a margin offset between the repeating graphics and background graphic. |
| **Graphics Padding** | Number of pixels as blank space padding on the left, right, top, and bottom of a graphic shown in the Graphic Repeater app.<br>**Padding** values are specified in a comma delimited ordinal list of integers as Left,Top,Right,Bottom.<br>0,0,0,0 is the default, which does not provide any padding.<br>For more information, See Details of the Padding Property. |
| **Display Columns** | Number of columns containing repeating graphics during runtime. Column numbers are specified as an integer and 0 is the default value.<br>The Graphic Repeater app includes a horizontal scroll bar to show columns outside of the limit set by the **Display Columns** property.<br>**Important**: If the product of the **Display Columns** and **Display Rows** values exceed 50, an error occurs at runtime.<br>For more information, see Details of the DisplayColumns Property.<br>**Property Value Requirements**<br>• **Display Columns** value must be an integer.<br>• **Display Columns** value cannot exceed 50. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| **Display Rows** | Number of rows containing repeating graphics shown during runtime. Row numbers are specified as integers and 0 is the default value.<br><br>The Graphic Repeater app includes a vertical scroll bar to show rows outside of the limit set by the **Display Rows** property.<br><br>**Important**: If the product of the **Display Columns** and **Display Rows** values exceed 50, an error occurs at runtime.<br><br>For more information, see Details of the Display Rows Property.<br><br>**Property Value Requirements**<br><br>• **Display Rows** value must be an integer.<br>• **Display Rows** value cannot exceed 50. |
| **Background** | Optional background color that appears in the entire pane area in which the Graphic Repeater app has been placed. No color is the default background.<br><br>Select the **Background** entry field to show a color picker control to select a background color. |

The Graphic Repeater app includes two read-only properties that show the current minimum and maximum values of the custom property associated with the **Sort By** property. These two properties can be used only in scripts.

**Important**: In scripts, you must be careful in typecasting to the appropriate datatype and include checking for null values.

| | |
|---|---|
| **MaxValue** | Gets the current maximum value of the **Sort-By** custom property from the set of repeatable graphics.<br><br>This property can be accessed only by script.<br><br>**Example**<br><br>MyViewApp.VAN.Max = MyContent.GraphicRepeaterControl1.MaxValue; |
| **MinValue** | Gets the current minimum value of the **Sort-By** custom property from the set of repeatable graphics.<br><br>This property can be accessed only by script.<br><br>**Example**<br><br>MyViewApp.VAN.Min = MyContent.GraphicRepeaterControl1.MinValue; |

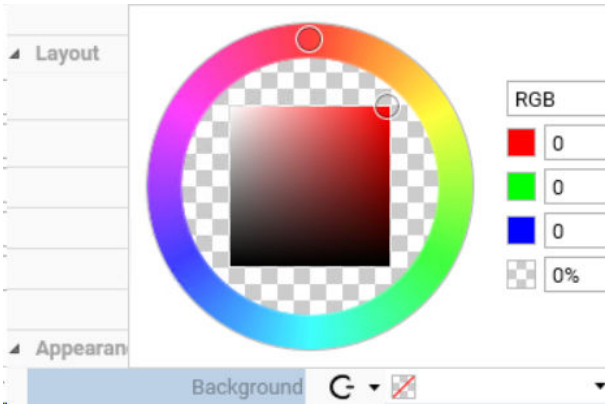
## Details of Background Properties

A background that appears behind the list of repeating graphics can be specified as a solid fill color specified by the **Background** property, or another graphic specified by the **Background Graphic** property. The background properties are not mutually exclusive. You can use both properties to assign a background to a Graphic Repeater app.

The **Background** property includes a color picker control that appears when you select the data entry field with your mouse. The selected background color appears in the pane with the repeating graphics list in the

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

foreground. Choose a background color that will provide sufficient contrast to the colors used in the repeating graphics.




The graphic specified by the **Graphic Background** property stretches to fit the full width and height of the pane in which the Graphic Repeater app has been placed. The graphic does not maintain its original horizontal and vertical dimensions. As a result, text in the graphic can be skewed and captions no longer align with the elements of graphics.

The **List Margin** property can compensate by setting offset padding between the background graphic and the list of repeating graphics for better alignment of the text in the background graphic To reduce the visual problems caused by stretched background graphics, create a background graphic that is similar in size to the pane in which the Graphic Repeater app is placed.

### Details of Comma Delimited Data

Commas are used as delimiters to separate multiple values specified for Graphic Repeater app custom properties. A comma is always used as the data delimiter regardless of the regional setting of the computer.

The following table shows examples of a comma delimited strings and how the entered data is parsed.

| Comma Delimited Strings | Parsed Data |
|---|---|
| 10,"Hello There",30,"Second" | 10<br>"Hello There"<br>30<br>"Second" |
| 40,"Hello",50 , "World", 100 | 40<br>"Hello"<br>"50"<br>"World"<br>"100" |
| 40,"Hello, How "are" you",50 ,"World",100 | 40<br>"Hello, How "are" you"<br>50 |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| | "World"<br>100 |
| 40,"Hello, How "are" you",50 "World",100 | 40<br>"Hello, How "are" you"<br>50 "World"<br>100 |
| 40,"Hello,,,,,Th"""ere"",50"Se"co"nd | 40<br>"Hello,,,,,Th"""ere"<br>50"Se"co"nd |
| 35,Obj.Attribute1,"Pump1 output,36,Obj.Attribute2 | 35<br>Obj.Attribute1<br>"Pump1 output,36,Obj.Attribute2 |
| 35,Obj.Attribute1,Tank2 Volume Attribute,",36,Obj.Attribute2 | 35<br>Obj.Attribute1<br>Tank2 Volume Attribute<br>",36,Obj.Attribute2 |

**Data** property values can be entered as free text, making data parsing more complex. The following rules are followed to parse a comma delimited string containing many quotation marks and commas.

- If data starts without a quotation mark, the entered data is evaluated as a single value until a comma appears in the string.
- If data starts with a quotation mark, the entered data is evaluated as a single value until the next quotation mark and comma (",) appears in the string.

### Details of the Data Property

The Data property is the only property in the Graphic Repeater app that can be modified at runtime through scripting. See Example of a Layout Script with the Graphic Repeater App for more information.

The following table shows the format of data entered as Graphic Repeater app property values.

| Data Type | Format | Example |
|---|---|---|
| Integer | Value | 22 |
| String | "Value" | "Inlet Pump" |
| Boolean | Value | True or False |
| Float | Value | 117.33 |
| Double | Value | 222.09 |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | | |
|---|---|---|
| DateTime | "T:value" | "T:7/15/2012 2:13:41.978 AM" |
| Elapsed Time | "E:value" | "E:09:32:00.0000000" |

Any data value placed between quotation marks are considered as a string with the exception of DateTime and ElapsedTime data types.

All object data references should be formatted as:

*Object_Name.Attribute_Name*

### Calculate the Number of Repeatable Graphics

The number of repeatable graphics rendered by the Graphic Repeater app is the quotient of the number of data groups specified by the **Data** property divided by the number of custom properties.

Number of repeatable graphics = Number of data groups / Number of custom properties

If the number of data points in a data group does not match the number of custom properties, the data group is discarded and a message appears in the logger.

**Example**:

Custom Properties: level,state,

Data: 100,"California”,90,"Nevada”,50,"Oregon",45

In this example, three repeatable graphics are shown and the fourth partial data point (45) is discarded.

### Example of a Layout Script with the Graphic Repeater App

Layout scripts can be used to provide reference values for the custom properties of the Graphic Repeater app.

The following example shows a simple layout script that provides a string and an object reference for the two **Name** and **Value** custom properties of a repeatable graphic.

```
MyContent.GraphicRepeaterControl1.Data = " ""Pump1"",PLCSim.Triangle1," +
                " ""Pump2"",PLCSim.Triangle2," +
                " ""Pump3"",PLCSim.Triangle3," +
                " ""Pump4"",PLCSim.Triangle4,"+
                " ""Pump5"",PLCSim.Triangle5," +
                " ""Pump6"",PLCSim.Triangle6," +
                " ""Pump7"",PLCSim.Triangle7," +
                " ""Pump8"",PLCSim.Triangle8,"+
                " ""Pump9"",PLCSim.Triangle9";
```

The following table describes some of the details of the layout script.

| **Script Components** | **Description** |
|---|---|
| `MyContent.GraphicRepeaterControl1` | Instance name of the Graphic Repeater app specified by the **Name** property on the app's **Property** page. |
| `Data` | **Data** property of the Graphic Repeater app.<br>The Data property is the only property that can be changed at runtime by scripting. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| `""Pump1""` | Static string enclosed by double quotation marks for the **Name** custom property of the repeatable graphic |
| `PLCSim.Triangle1` | Object reference for the **Value** custom property of the repeatable graphic. |
| `" ""Pump1"",PLCSim.Triangle1," +`<br>`...`<br>`" ""Pump9"",PLCSim.Triangle9";` | Script shows the repeatable graphic nine times with different assigned string and object reference values. |

### Comparison of App Properties and Scripting Attributes

Graphic Repeater app properties can be incorporated into layout scripts as attributes. In most cases, app properties and script attributes have similar names with the exception of no blank spaces in attribute names. However, the Graphic Repeater app does have some properties that are very different than their corresponding attributes names.

The following table shows the differences between Graphic Repeater app properties and layout script attributes.

| **Graphic Repeater App Properties** | **Graphic Repeater App Scripting Attributes** |
|---|---|
| Graphic Name | GraphicName |
| Background Graphic | BackgroundGraphicName |
| Custom Properties | CustomProperties |
| Data | Data |
| Filter Top N | FilterTopN |
| Sort By | SortBy |
| Sort Order | SortOrder |
| Live Sorting | DynamicSort |
| View Mode | ViewMode |
| Fill Style | FillStyle |
| List Margin | ListMargin |
| Graphics Padding | GraphicsPadding |
| Display Columns | DisplayColumns |
| Display Rows | DisplayRows |
| Background | Background |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Details of Sort Properties

The Graphic Repeater app includes three properties that determine how repeatable graphics are sorted during runtime:

- **Sort By**

  Specifies a custom property whose current value is used to sort repeatable graphics.

  If the entered custom property name binds to a reference during design time ,the datatype of **Sort By** is initially evaluated as a string After receiving the subscribed value during runtime, the **Sort By** datatype changes to that of the subscribed value.

- **Sort Order**

  Specifies if repeatable graphics are sorted by their current custom property values in ascending or descending order.

- **Live Sorting**

  Boolean value that determines if repeatable graphics are sorted during runtime. A script can be used to enable or disable sorting during runtime by by changing the Boolean value of **Live Sorting**.

### Details of the Live Sorting Property

The Graphic Repeater app uses virtualization to reduce memory load and maintain acceptable performance during runtime. Virtualization minimizes memory usage by loading only those repeatable graphics that appear in the layout pane. Virtualization removes those repeatable graphics from memory that are not shown in the visible layout pane. Repeatable graphics are reconstructed again when the user scrolls the pane to show the graphics in the pane. Those graphics moved out of the pane view by scrolling are removed from memory.

The Graphic Repeater app disables virtualization when the **Live Sorting** property is active. Graphics that do not appear in the layout pane are still loaded in memory. As a result, performance can be affected if the Graphic Repeater app includes a large number of repeatable graphics.

Follow these recommendations for the number of repeatable graphics based upon whether sorting will be active or not during runtime.

- When **Live Sorting** is active, restrict the number of repeatable graphics to a maximum of 50.
- When **Live Sorting** is inactive, restrict the number of repeatable graphics to a maximum of 200.

Other factors affect the performance of the Graphic Repeater app during runtime. The maximum limits listed above are for a single instance of the Graphic Repeater app in a running ViewApp. If a ViewApp includes multiple instances of the Graphic Repeater app that run simultaneously, the number of repeatable graphics displayed by each instance is reduced to the maximum limit divided by the number of instances.

### Details of the Fill Style Property

The Fill property includes two options to order graphic items in the Content Presenter app horizontally or vertically.

In the case when the ViewMode property is set to ListContent, the viewer pane includes scroll bars to view graphic items that extend beyond the bottom or right border of the viewer pane.

In the case when the ViewMode property is set to WrapContent, graphics appear on the next row or next column based on whether the Fill property value is Horizontal or Vertical.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Details of the Padding Property

Graphics padding is the blank space placed around the borders of repeating graphics during runtime. Padding values are specified by the number of pixels placed at the left, top, right, and bottom borders of a graphic, which are specified as four positional integers separated by commas.

L,T,R,B

No padding is the default, which is specified as 0,0,0,0.

The aspect ratio of the repeating graphic is maintained when padding is applied. In the case when a graphic extends beyond the pane border because of padding, the repeating graphic is reduced in size until it fits within the pane while including the padding space.

### Details of the DisplayColumns Property

The value assigned to the **DisplayColumns** property determines the number of columns that appear within the Graphic Repeater app during runtime. A non-zero value shows graphics in the specified number of columns and the graphics are scaled to fit the width of each column. The remaining graphics beyond the column limit appear on the next row of the view pane.

A value of zero indicates the **DisplayColumns** property is ignored and graphics appear in the viewer window in as many columns as calculated based on the values of other Graphic Repeater app properties.

### Details of the Display Rows Property

The **Display Rows** property specifies the number of graphics that can be placed on a row within the pane in which the Grapher Repeater app has been placed.

A value of Zero indicates that row specification is ignored and repeatable graphics appear in as many rows as calculated based on various factors such Contents Size, Fill Mode, Size Mode, Pane size etc.

### Validity Checking During Runtime

The Graphic Repeater app validates the following property values when a ViewApp starts running that contains an instance of the Graphic Repeater app

| **Properties** | **Validation Checking** |
|---|---|
| **Graphic Name** | No graphic name assigned |
| **Custom Properties** | Number of assigned custom properties is zero or greater than 20. |
| **Filter Top N** | **Filter Top N** is assigned a number greater than the number of data points |
| **Display Rows** | **Display Rows** is assigned a number greater than 50. The product of assigned **Display Rows** and **Display Columns** values cannot exceed 50. |
| **Display Columns** | **Display Columns** is assigned a number greater than 50. The product of assigned **Display Rows** and **Display Columns** values cannot exceed 50. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

An error icon appears when the ViewApp containing starts if invalid Graphic Repeater app property values are detected. The ViewApp continues running, but the pane containing the Graphic Repeater app shows the error icon.




One or more error messages appear in the Operations Control Logger with descriptions of the problems.

Data property values are not validated when the ViewApp starts. If Data values are out of range, the pane containing the Graphic Repeater app is blank without displaying an error icon. But, error messages are written to the Operations Control Logger.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

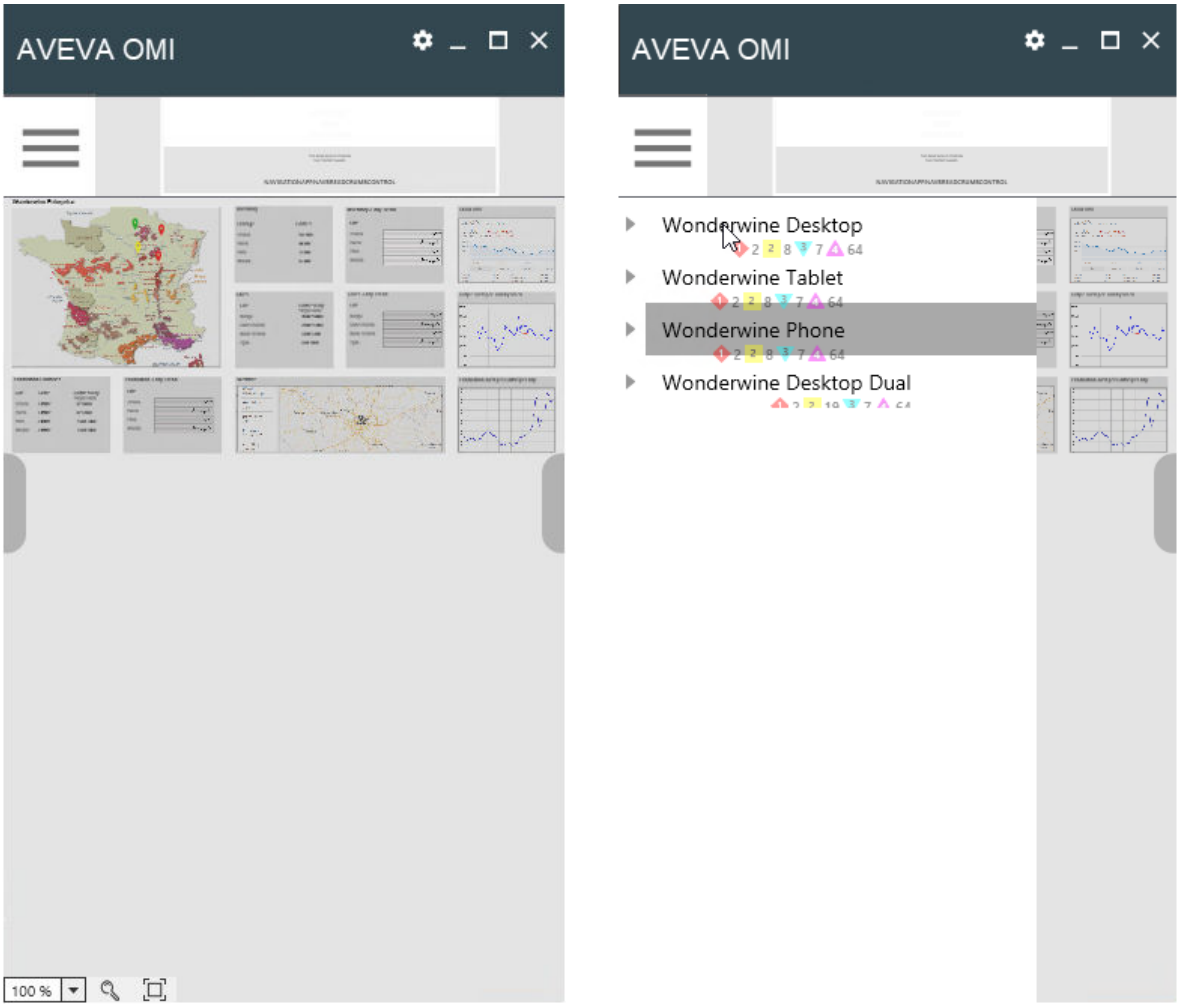
## Upgrade and Migration of the Graphic Repeater App

The Graphic Repeater app can be downloaded from AVEVA Digital Exchange and then imported into AVEVA System Platform 2020. The *AVEVA Graphic Repeater OMI App Readme* includes instructions to import the app into System Platform 2020.

- The Graphic Repeater app is targeted for System Platform 2020.
- The Graphic Repeater app can be migrated to subsequent versions of System Platform when they become available.
- Users can export the Graphic Repeater app to an .aaPKG file and then import the aaPKG file into a future release of System Platform.

# HamburgerApp

The HamburgerApp controls the movement of a selected layout slide-in pane. During run time, the HamburgerApp appears as a button consisting of three parallel horizontal lines. When the user selects the button, the selected slide-in pane appears. Users can toggle the hamburger button again or select an area outside of the slide-in pane to hide the pane.




© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

The HamburgerApp is typically placed near the top corner of a window to save screen space for ViewApps designed to run on cell phones or tablets.

## Configure the HamburgerApp

The HamburgerApp includes properties to select a slide-in pane that slides out when the app is selected and the foreground and background colors of the hamburger button.

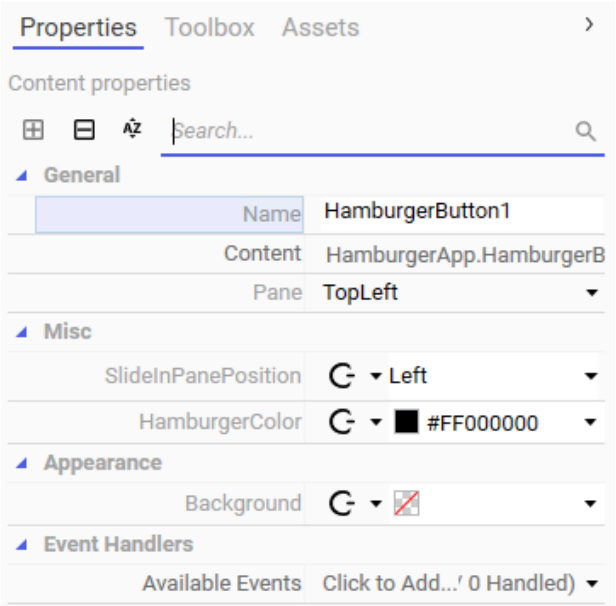
Each property contains a drop-down list to reset the property to its default value by selecting the visual icon next to the data entry field.




**To configure a HamburgerApp**

1. Open the Layout or ViewApp Editor and show the items listed in the **Toolbox** tab.
2. Select HamburgerApp from the **Toolbox** list to show its preview thumbnail.
3. Drag and drop the preview thumbnail on a layout pane.
4. Select the preview thumbnail on the pane and select the **Properties** tab.

   The **Properties** tab shows a list of HamburgerApp properties.




5. Set the **Background** and **HamburgerColor** color properties.

   Both properties include a color picker. Select the color property and then select the small triangle at the right of both property fields to show the color picker.

6. Select the **SlideinPanePosition** field to show a list of slide-in pane positions (**Left**, **Top**, **Right**, **Bottom**) to activate on the layout. **Left** is the default slide-in position.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

7. If you want to create event handler scripts, select the **Available Events** data entry field to show a list of HamburgerApp events. For more information about creating event handler scripts, see Add an Event Handler Script.
8. Save your property selections.

### Sizing the Hamburger App to the Layout Pane

It can occur that the Hamburger App does not adjust its size at run time to adapt to the size of the hosting layout pane. There are several methods to resolve HamburgerApp and pane relative size issues. One recommended method is to adjust pane properties to your layout. For example, the width and height pane properties can be adjusted to fixed sizes to fit your specific layout. You can do this with a quick calculation of the HamburgerApp container pane size as a percentage of total layout width and height. Adjust that number to accommodate the HamburgerApp dimensions.

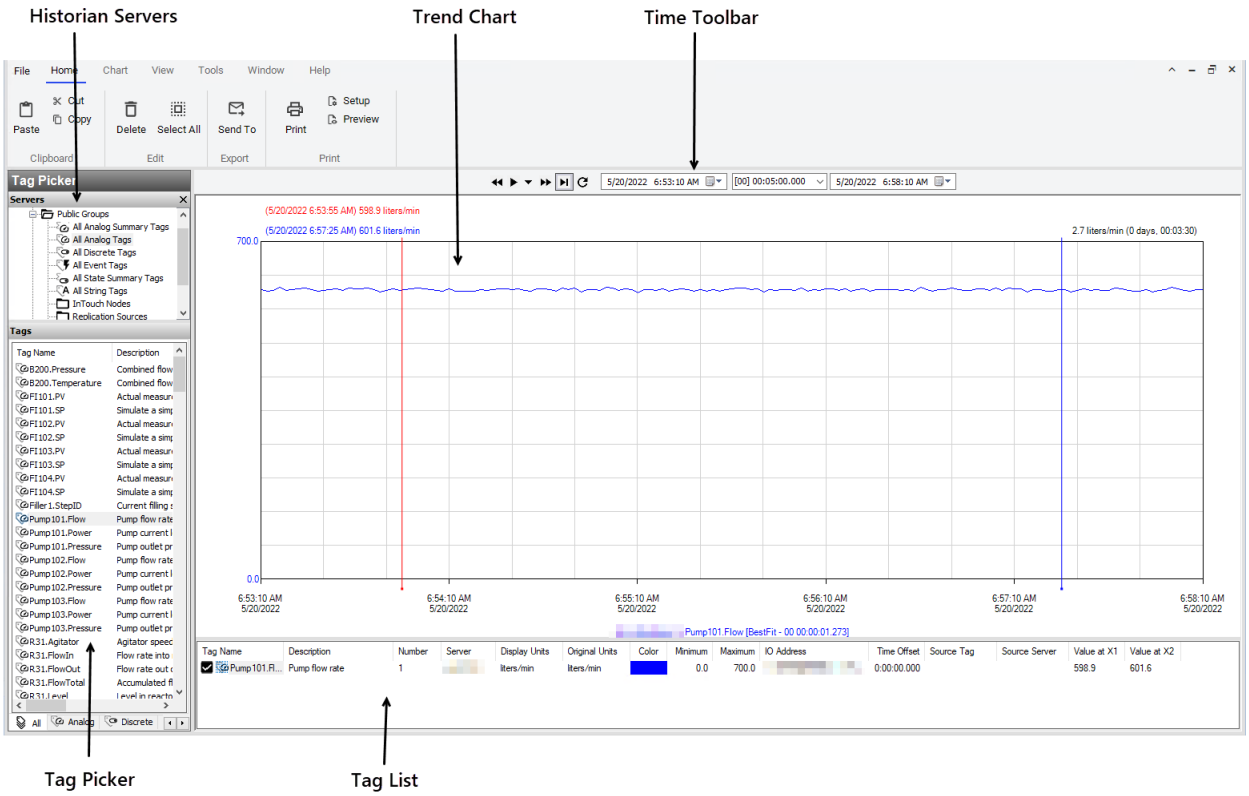
## AVEVA Historian Client Trend

AVEVA Historian Client Trend is a stand-alone app which contains a set of properties that can be configured in both design-time and run-time. The design-time properties are set to default values that enable you to show trends in your ViewApps with minimal configuration work. Changes made to a property during run time override the value set to the same property during design time.

When you start the Historian Client Trend for the first time, you must log on and connect to a Historian server. If you are opening an existing Trend file that includes at least one server configuration and the log in was successful, you are not prompted to log on. For more information about connecting to a Historian, see Creating a New Server Connection.

After you establish a connection with the server, the Trend main window appears.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.



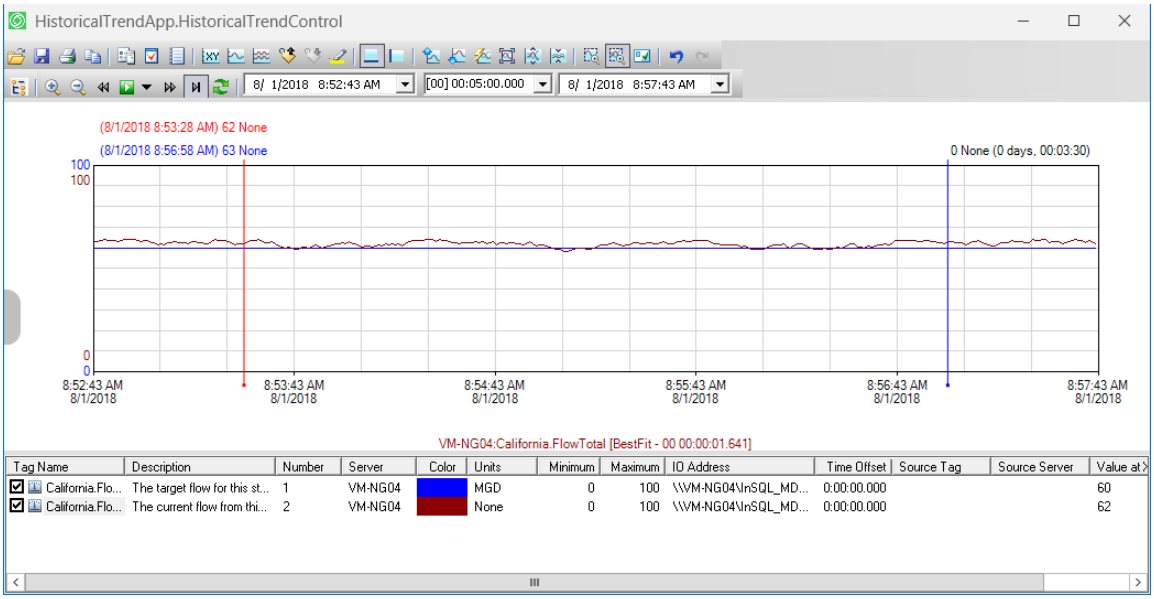

- For information about assigning values to properties, see Configuring Trend File Properties.
- For information on using the Tag Picker and the Time picker, see Configure a Trend. To show or hide tool bars or components, use the corresponding commands on the **View** menu.

## HistoricalTrendApp Properties

The HistoricalTrendApp includes a set of design-time properties that enable or disable visual or functional components of the Historical Trend during run time. All properties are assigned default values to enable the HistoricalTrendApp to run immediately in a ViewApp with minimal run-time configuration.

The following figure shows the Historical Trend control running in a ViewApp after accepting the default values assigned to its **Run-Time Behavior** properties.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




## Configure HistoricalTrendApp Properties

The HistoricalTrendApp shows two different types of properties in the **Properties** area of the Layout editor. The **Run-Time Behavior** properties are the native properties of the HistoricalTrendApp. This topic provides descriptions of these properties.

The remaining properties are from the underlying .NET trend control that are exposed and can be assigned values from the Layout editor or included in scripts. .NET property groups are identified by the TrendControl prefix in their titles that appear on the **Properties** page. For example, the **TrendControl.Accessibility** title appears immediately beneath the **Run-Time Behavior** group of properties. For more information about the .NET public properties, methods and scripts, see More Information about Underlying .NET controls of the AlarmApp and the HistoricalTrendApp.

Descriptions of .NET properties are accessible from the Microsoft Web site and are not described in System Platform documentation. For more information about the .NET properties that appear in the HistoricalTrendApp, see .NET property descriptions at the Microsoft web site.

A .NET control enables developers to include a description using the DescriptionAttribute, as shown in the following example.

```
[DescriptionAttribute("Represents a double-precision 64-bit number ")]
```

The text shown as part of the DescriptionAttribute appears in the **Description** area of the **Properties** tab in Layout and ViewApp editors.

### To configure the properties of theHistoricalTrendApp

1. Open the Layout and show the items listed in the **Toolbox** tab.
2. Select the HistoricalTrendApp from the **Toolbox** list to show its preview thumbnail.

   The **Toolbox** pathway to the Historical Trend App is:

   _Default Content > 4. Apps > AVEVA OMI Apps > HistoricalTrendApp
3. Drag and drop the preview thumbnail onto a layout pane.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

4. Select the preview thumbnail on the pane and select the **Properties** tab.

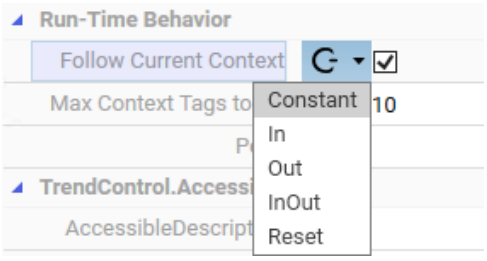
   The **Properties** tab shows a list of HistoricalTrend app properties. Use the Layout editor search function to search for a property by name.

   **General** properties show the name of the control, its content type, and the name of the pane in which the HistoricalTrendApp is placed.

5. Set values to the **Run-Time Behavior** properties.

   **Important**: See Upgrading HistoricalTrend App Runtime Properties in System Platform 2020 for information about the **Run-Time Behavior** properties of the HistoricalTrendApp after upgrading to System Platform 2020.

   Most HistoricalTrendApp properties include a user control with a drop-down list of binding options to configure static or dynamic value based binding between the property and its associated reference.




| | |
|---|---|
| **Constant** | Static binding to the specified property value. Enter a value in the property data entry field. |
| **In** | Dynamic property value with read only binding by the control to a reference. |
| **Out** | Dynamic property value with write only binding by the control to a reference. |
| **InOut** | Dynamic property value with read/write binding by the control to a reference. |
| **Reset** | Reset the property binding value to its default. |

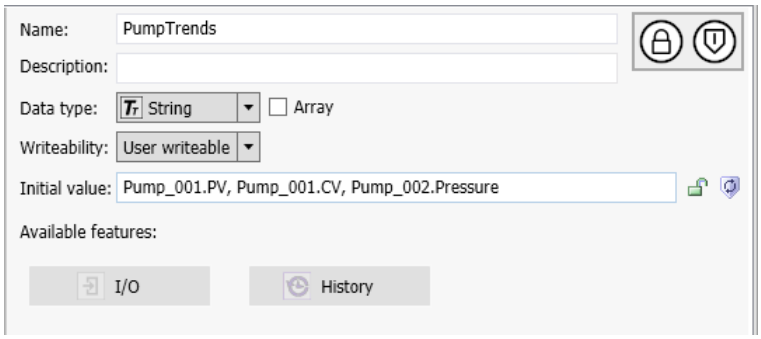
   A check box to the right of some properties indicates the initial default value of a Boolean property. When the check box is selected, the property is set to true.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Run-Time Behavior Properties

| | |
|---|---|
| **Follow Current Context** | Boolean value that determines if the trend shows values of the attributes belonging to the selected asset. True (default value) shows the selected asset's attribute values on the trend.<br><br>The historized tags are picked from the currently selected asset in alphabetical order. The number of tags that can be shown from an asset is set by the **Max Content Tags to Show** property.<br><br>With the property set to true, trend pens are auto-discovered and loaded asynchronously. This can cause unpredictable results if you will use the ShowContent() method to place the Historical Trend control into a pane at run time, or if the Follow Current Context property can be dynamically modified at run time. In these cases, set **Follow Current Context** to FALSE.<br><br>**Note**: If **Follow Current Context** is set to False, the **Show Tag Picker** property must be set to True.<br><br>**IMPORTANT:** In prior releases, Historical Trend App properties were not exposed. System Platform exposes a number of configurable properties and sets some to a default value. For example, in Updates 1 and 2, the TagPicker was visible when you used the Historical Trend App. In Update 3, the TagPicker is not visible by default, since tags from the current context are shown when **Follow Current Context** is true.<br><br>For more information about automatically selecting tags to show in the trend based on the selected asset from the navigation model, see Follow Current Context Property. |
| **Max Context Tags to Show** | The number of attribute values from the selected asset that can be shown on the trend when the **Follow Current Context** property is set to True. 10 is the default maximum number of tag values shown on a trend, and is the recommended maximum. If more than 10 tags are shown, performance may be affected.<br><br>**Note**: When **Follow Current Context** is set to False, the **Max Auto Content Tags to Show** property is inactive. The entered number has no meaning. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

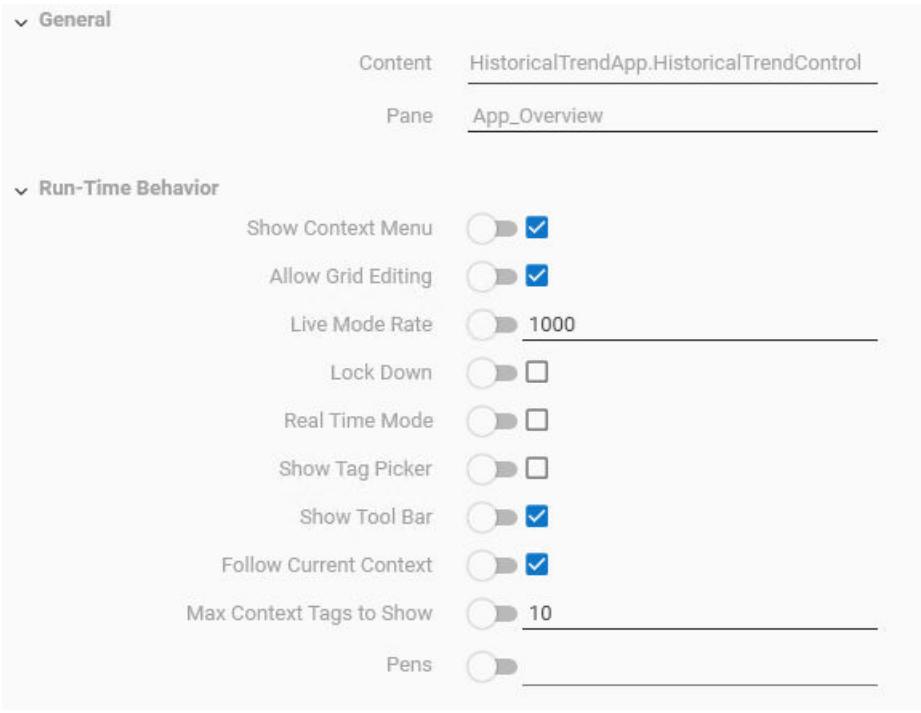
| | |
|---|---|
| **Pens** | The Pens property enables you to add specific tags to be shown in the view application at run time. Note that tag names are not validated. The tags you add are in addition to the Current Context tags. See **Follow Current Context** for more information.<br>• To add tags using static binding, set the value of this property to be one or more fully qualified tag names. Multiple tags must be separated by a comma. The following example shows three tag names, each using an application object name (`Pump_00n`) and attribute name (PV, CV, and `Pressure`):<br>`Pump_001.PV, Pump_002.CV, Pump_001.Pressure`<br>• To add tags using dynamic binding, create a string attribute that contains the tag name(s) that you want to add as trend lines. Enter the reference in the following format:<br>`MyViewApp.<ViewAppNamespaceName>.<AttributeName>`<br>For example:<br>`MyViewApp.MyTrendSettings.AdditionalPens`<br>The reference attribute must contain the tag name(s), formatted the same way as with static binding (ObjectName.AttributeName). As with static binding, separate multiple tags with a comma.<br>If you use an application object reference instead of a ViewAppNamespace reference, enter the reference as the application object name followed by the attribute name, separated by a dot (period)<br>`<AppObjectName>.<AttributeName>`<br>  |

## Upgrading HistoricalTrend App Runtime Properties in System Platform 2020

In System Platform 2017 Update 3 Service Pack 1 and earlier releases, the HistoricalTrendApp included a set of runtime behavior properties that enabled its visual components to be shown or hidden during runtime. Other properties determined some aspects of the HistoricalTrendApp's behavior.

The following screen capture shows the properties of the HistoricalTrendApp that were available in System Platform 2017 Update 3 Service Pack 1

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

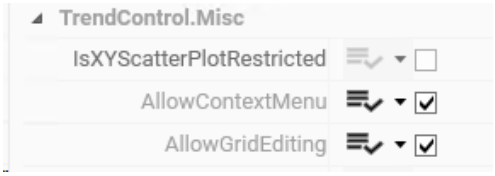



In System Platform 2020, many of the former **Run-Time Behavior** properties of the HistoricalTrendApp have been removed because the underlying control properties are exposed and can be directly configured in the **Properties** grid of the Layout editor.




Upgrading from an earlier release of System Platform to System Platform 2020 retains the values assigned to the legacy properties that were removed and re-directed directly to the underlying control's properties. The HistoricalTrendApp in System Platform 2020 should look and behave similarly to earlier versions of the app in prior releases of System Platform.

The following example shows the former **Show Context Menu** and **Allow Grid Editing** properties that were available in System Platform 2017 Update 3 Service Pack 1 that have been replaced by the equivalent underlying HistoricalTrendApp control properties.




## Follow Current Context Property

When set to True (default value), shows attribute values for up to 10 tags from the selected asset on the trend. The historized tags are picked from the currently selected asset in alphabetical order, up to the maximum set by the **Max Content Tags to Show** property. Tags are shown only from th first connected Historian Server.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

With the property set to true, trend pens are auto-discovered and loaded asynchronously. This can cause unpredictable results if you will use the ShowContent() method to place the Historical Trend control into a pane at run time, or if the Follow Current Context property can be dynamically modified at run time. In these cases, set **Follow Current Context** to FALSE.

**Note**: If **Follow Current Context** is set to False, the **Show Tag Picker** property must be set to True.

**IMPORTANT:** In prior releases, Historical Trend App properties were not exposed. System Platform 2017 Update 3 exposes a number of configurable properties and sets some to a default value. For example, in Updates 1 and 2, the TagPicker was visible when you used the Historical Trend App. In Update 3, the TagPicker is not visible by default, since tags from the current context are shown when **Follow Current Context** is true.

## Configure a Trend

When you configure a trend, you must select the tag(s) for which you want to query the trend data. This data is queried from the Historian database(s) to which you are currently logged on. After you select tags for the trend, you can set the start date and end date for the trend. The default settings in the Trend app are generally adequate to enable you to begin tracking trends.

The following list summarizes the key steps to configure the HistoricalTrendApp during run time.

1. Place the HistoricalTrendApp on a layout pane.
2. Configure the Trend app properties. You can use the default settings, or change them as needed. Default settings are as follows:
   - **Follow Current Context:** Enabled
   - **Max Context Tags to Show:** Up to 10 context tags are shown by default. If the asset you are viewing has more than 10 tags, the first 10 that are listed alphabetically are shown. Showing more than 10 may impact performance.
   - **Pens:** Empty (null). You can add additional context tags to show their trend data by entering the static value or bind to a reference. The pens configured here are in addition to the max context tags setting. List additional pens by entering fully qualified attribute names (for example, ObjectName.AttributeName). Use a comma to separate attribute names. You can also bind a reference to you pen list. To create a reference:
     i. Create a ViewApp Namespace object in the Visualization folder and rename it (for example, "TrendSettings").
     ii. Create an attribute of string type in the ViewApp Namespace. In the following example, the attribute name is "MyPens."
     iii. Add the fully qualified attribute names you want to add to the trend. Multiple names must be separated by commas.
     iv. For the Pens property, create the dynamic binding read-only reference to the ViewApp Namespace (for example, MyViewApp.TrendSettings.MyPens).
3. Deploy and start the ViewApp containing the HistoricalTrendApp.
4. Log in to the Historian Server that contains the data to you want to show in a trend.

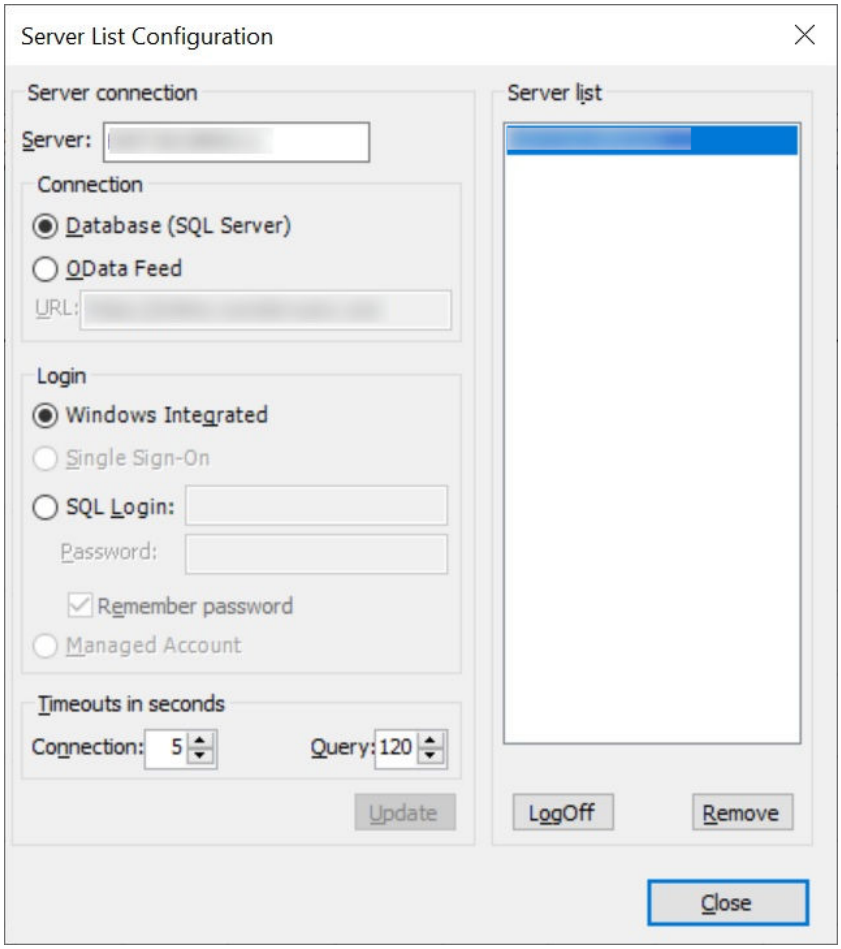
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

## Creating a New Server Connection

The first time you start a Historian Client application, you must create a server connection to the Historian. To create a connection, you need your assigned Historian username and password.

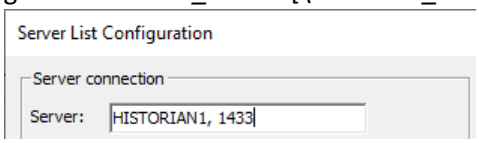
### To create a Historian connection

1. Start the Historian Client application.
2. On the **Tools** menu, select **Servers**. The **Server List Configuration** dialog box appears, which shows a list of connected servers or servers that were configured in the past.




3. In the **Server** field, enter the name of the server to which you want to connect.
   - For an On-Premises Historian, enter the name of the server where it is hosted.
   - For a Managed Historian, use a name of your choice.
   - For a SQL Server named instance, use the format <server_name>\<instance_name>.

**Note:** If the default port for the SQL Server is changed, the Historian Client server configuration should be given as *<server_name>*[*<instance_name>*], *<port_number>*. For example:




© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

4. In the **Connection** section, specify the type of connection you want to use:
   - **Database (SQL Server)**: Choose this option to connect to the SQL Server database.
   - **OData Feed**: Choose this option to connect to the open data protocol feed. Then specify the URL and continue to step 7. You can connect using this option only if you are using a Managed Historian connection.

     **Notes:** If you select OData Feed to connect to the Historian Server, all the fields related to Login section become unavailable and the Managed Account option becomes deselected automatically.

     By default, the Historian's OData server supports unencrypted HTTP connections. To use an encrypted (HTTPS) OData connection, you will first need to install and configure an SSL client certificate. Contact AVEVA Technical Support for details.
5. In the **Login** section, select one of the following:
   - **Windows Integrated:** Authenticate with Windows integrated security.
   - **Single Sign-On:** Authenticate with AVEVA Identity Manager. You must be using the connected experience for this option to be enabled.
   - **SQL Login:** Authenticate with SQL Server credentials, click **SQL Login** and configure the following login details. Then go to step 7.
     - **Login ID:** Type your assigned Historian username. If your system administrator has not assigned you a username and password, you may use one of the default user accounts, which are automatically configured during a typical Historian installation.
     - **Password:** Type the password that is associated with the username. Select the **Remember password** check box to specify for the system to remember your password.
6. In the **Timeouts in seconds** area, configure the time allocated for the database connection and the query execution.
   - **Connection:** The connection time-out period in seconds. Valid values are 1 to 600.
   - **Query:** The query time-out in seconds. Valid values are 1 to 600.
7. Select **Add**.

   After several seconds, the server connection should be established.
8. Click **Close**. An error message appears if a connection cannot be made to the Historian server.

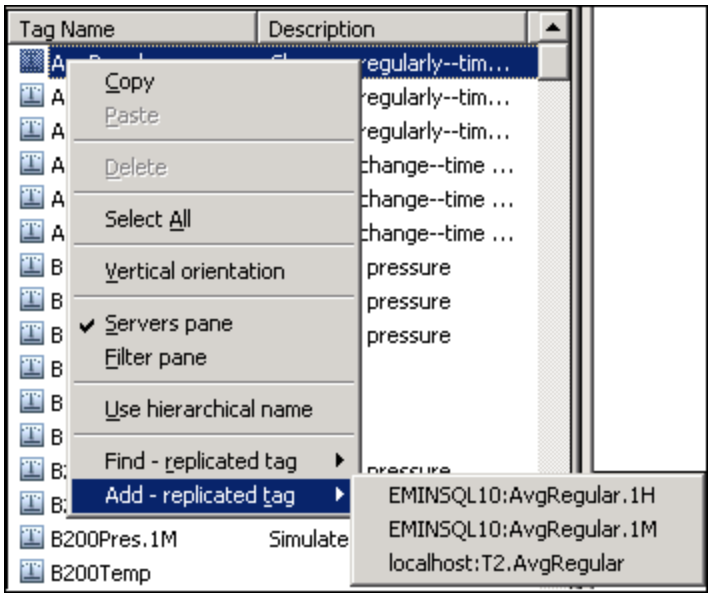
## Add a Source Tag to a Trend

You can select a source tag or replicated tag from the Tag Picker to add to the active trend chart. For more information about the different components of the Tag Picker, see Tag Picker.

### To add a source tag or replicated tag

1. Select a tag in the Tag Picker.
2. If the selected tag is a source tag, do the following:
   - In the **Tags** pane, right-click the selected tag, point to **Add - replicated tag**, and then click the tag that you want to add to the trend chart.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




The corresponding replicated tag is added to the active trend chart.

3. If the selected tag is a replicated tag, do the following:
   - In the **Tags** pane, right-click the selected tag, and then click **Add - source tag**.

The corresponding source tag is added to the active trend chart.

The **Add** command is not available if:

- Multiple tags are selected in the Tag Picker.
- A normal tag that is neither a source tag nor a replicated tag is selected in the Tag Picker.

**Note:** You cannot execute the **Add** command if a source tag is deleted but its replication configuration still exists in the Historian.

The replicated tags are not listed in the context menu if:

- The replicated tags are not committed in the Historian.
- The replication schedule is removed from the Historian. For example, you are connected to a Historian 10.0 server and you create a tag called ‘MyTag’. ‘MyTag’ is replicated as a simple tag called ‘MyServer.MyTag’. When you execute the **Add - replicated tag** command, the ‘MyServer.MyTag’ tag is shown. When you execute the **Add - source tag** command, the ‘MyTag’ tag is shown. At this instance, if the replication link between ‘MyTag’ and ‘MyServer.MyTag’ is removed and if you execute the **Add - replicated tag** command, the ‘MyServer.MyTag’ tag is not shown in the list of replicated tags.

  However, if you execute the **Add source tag** command, the ‘MyTag’ tag is shown as ‘MyTag’. If ‘MyServer.MyTag’ is the only replicated tag, ‘MyTag’ is considered as a normal tag.

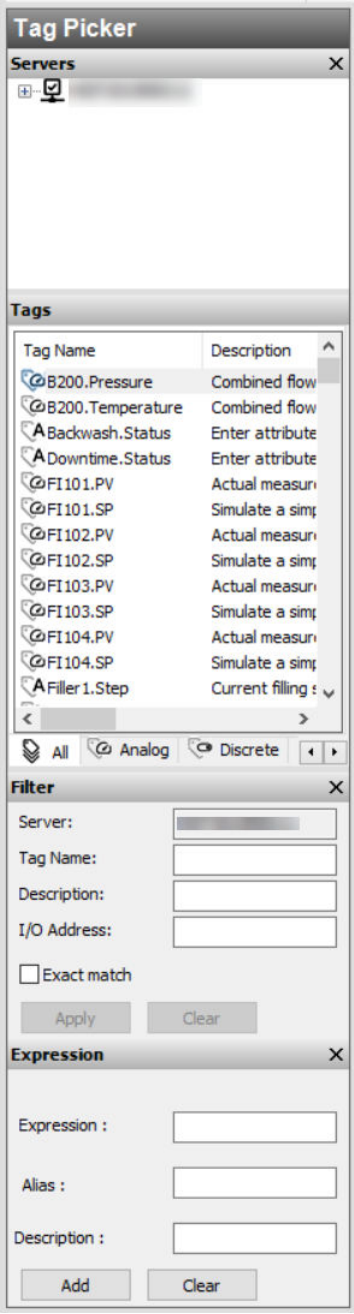
  This scenario holds true if the entire replication schedule is removed in the Historian. If only one replication is removed, the list shows the remaining replicated tags.

## Tag Picker

The Tag Picker shows which tag groups and tags exist in the database. It shows all of the tags that are visible to the currently logged on user based on his or her permissions.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

Using the Tag Picker, you can quickly search the database for tags of a certain type, for tags that match a particular search pattern, or create an expression. You can then select the items you want to include for the client application or control.



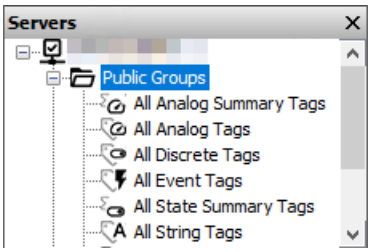

The Tag Picker is comprised of the following panes:

- Servers Pane
- Tags Pane
- Filter Pane
- Expression Pane

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

## Servers Pane

The **Servers** pane shows a list of Historian folders. The **Servers** pane enables you to navigate through the folder structure (namespace) of one or more Historian servers and select a group (folder) of tags.



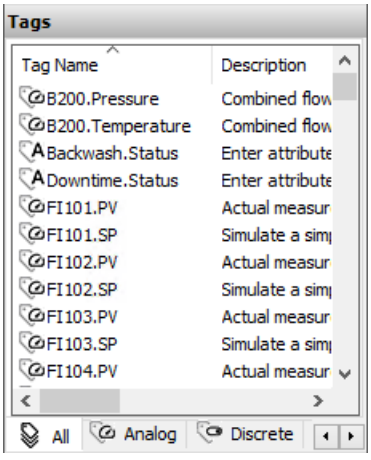

**Note:** When you select a parent item (such as Public Groups in the illustration above), the Tag Pane shows items from all of the child items (such as All Analog Summary Tags and its peers above).

The **Servers** pane shows the following items:

| Category | Description |
|---|---|
| Servers | All objects that make up the basic Historian system, such as tags, I/O Servers, defined engineering units, storage locations, and so on. |
| Public Groups | All objects that are visible to all clients. If you have administrative permissions, you can create, rename, and delete groups in the public groups folder. |
| Private Groups | All objects that are visible to the user that is currently logged on. Users can create, rename, and delete groups in the private groups folder. |

## Tags Pane

The **Tags** pane shows all the tags for the currently selected group in the **Servers** pane.



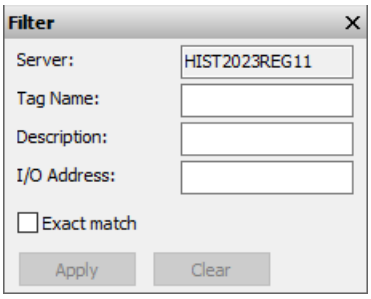

- To select multiple tags from the list, hold the CTRL and/or SHIFT key while clicking.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- To view only tags of a certain type, click the appropriate tab at the bottom of the pane.
- To sort the table by a particular column, click the column heading.

### Filter Pane

Use the **Filter** pane to filter the tags listed in the **Tags** pane according to criteria that you specify. You can filter tags by name, description, and I/O address.




The following wildcard characters are supported:

| Wildcard Character | Filter Function |
|---|---|
| % | Any string of zero or more characters. |
| _ | Any single character. |
| [ ] | Any single character within the specified range or set. For example:<br>• [a-f]<br>• [abcdef] |
| [^] | Any single character not within the specified range or set. For example:<br>• [^a - f]<br>• [^abcdef] |

For example, to find all tag names ending with "level," enter "%level." Filter criteria are not case-sensitive.

**Note:** Wildcard characters cannot be treated literally in a filter; they will always act as wildcard characters.

When the **Servers** pane and the **Filter** pane are both visible, the filter conditions apply to the selected group in the **Servers** pane. When the **Servers** pane is hidden, the filter applies to all of the tags for the selected Historian.

#### To apply a filter

1. In the **Server** field, specify or verify the server.

   This field is not available if the **Servers** pane is visible.
2. In the **Tag name** field, enter the string to match for the tagname.
3. In the **Description** field, enter the string to match for the description.
4. In the **I/O Address** field, enter the string to match for the I/O address.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

5. Select **Exact match** to search for tags that exactly match the entire string that you provided for the tagname and/or description fields.

   For example, if you specify "level" as the tagname and do not select **Exact match**, any tagname that contains the string "level" appears. This will include tagnames such as "ReactLevel," "ProdLevel," and "$AccessLevel."

6. Click **Apply** to apply the filter criteria.
7. Click **Clear** to clear the filter criteria.

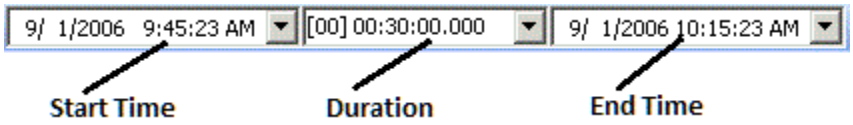
## Time Picker

The time picker enables you to select a time range by specifying a start time, end time, and/or duration.

An error appears next to the start or end time controls if you specify an invalid time period. For example, an end time before a start time.

### To specify a time period

1. On the Time toolbar, specify the start time, end time, and/or duration. To select a date from a calendar, click the down arrow on the start time or end time list. To select a predefined duration, click the down arrow on the duration list.

   When you change one of the options, one of the other options is recalculated automatically. While you change the option, a blue frame appears around the option that will be recalculated as a result of the change.

   The relation between changed and updated options is as follows:

| You change... | The time picker updates... |
|---|---|
| Start time | End time (based on duration) |
| End time | Start time (based on duration) |
| Duration | Start time (based on end time) |

   If you change multiple options in a row, which option is updated depends on which two other options you changed last. For example, if you change the start time and then the end time, the duration is calculated accordingly. If you change the start time and then the duration, the end time is calculated, and so on.

2. Press Enter.

### To specify a time period relative to the current time

1. Do one of the following:
   - On the **Chart** menu, click **Update to Current Time** so that a check mark appears.
   - Click the **Update to Current Time** toolbar button so that it is highlighted.
2. In the duration list of the Time toolbar, click a duration or type one manually.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

The start time is automatically calculated as the current time minus the duration you selected, and the trend display is updated with the new time period.

## Configuring Trend Application Options

The trend options allow the user to configure the trend application. These options apply to all saved trend files. Categories of trend options that can be set include:

- Configuring Retrieval Options
- Configuring Color Options
- Configuring Time Zone Options
- Configuring Miscellaneous Options
- Configuring Other Options

### Configuring Retrieval Options

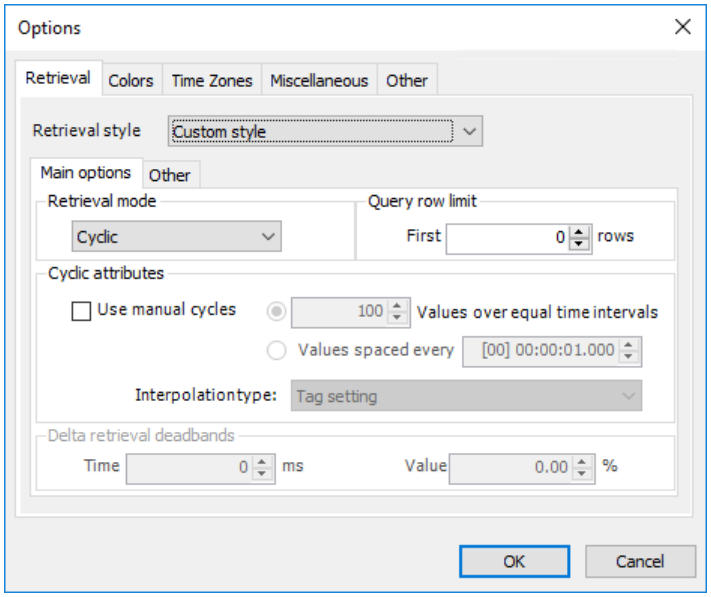
You can define data retrieval options at the application level. These options are used for all tags that do not have their own settings defined.

Application-level retrieval options are not saved in trend files. Therefore, trend files with tags that rely on application-level retrieval settings may look different depending on the retrieval options that are configured in the Trend application that they are opened in. To make sure that your tags are using specific retrieval options, define these options individually for each tag. For more information, see Configuring Trend Options for a Tag.

Most retrieval settings that you configure here only apply if you are retrieving data from a Historian with a version of 9.0 or later. If you are using an earlier Historian version, see Configuring Other Options and Working with Retrieval Styles for details.

#### To configure retrieval options

1. On the **Tools** menu, click **Options**. The **Options** dialog box appears with the **Retrieval** tab selected.




2. Do one of the following:

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- To use a predefined retrieval style, click its name in the **Retrieval style** list. For more information on retrieval styles, see Working with Retrieval Styles.
- To use custom retrieval settings, click **Custom style** in the **Retrieval style** list.

3. Specify any additional settings required.
   - If you are using custom retrieval settings, select a retrieval mode and specify all the settings that are relevant to it. For more information, see Understanding Retrieval Modes.
   - If you are using one of the predefined styles, you can edit all settings that are not covered by the style definition. For information on which settings are covered by style definitions, see Working with Retrieval Styles.

     Because a style definition can contain multiple sets of retrieval settings with different retrieval modes, some of the settings available for editing here may turn out to be irrelevant for the retrieval mode that actually gets used for a given query. However, because there is no way to know in advance whether this will be the case, the settings are still available for editing.

   For more information on the various retrieval options, see Understanding Retrieval Options.

By default, the retrieval settings that you specify here are used for all tags on all trend charts. However, you can override these settings individually for each tag. For more information, see Configuring Trend Options for a Tag.

## Configuring Color Options

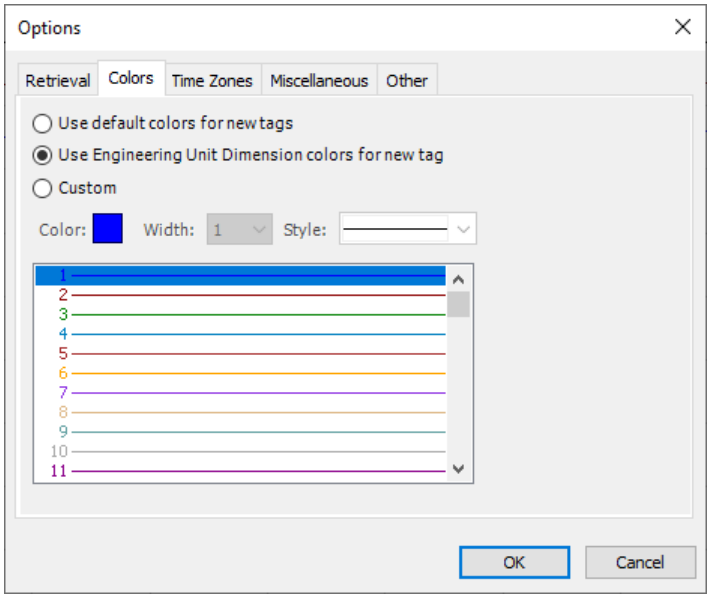
The trend color options control how the trend pen looks for each new tag as it is added to the chart. By default, Trend includes 256 different pen styles, which are numbered from 1 to 256. An unused style is applied each time you add a tag to the trend chart. The trend assigns the lowest pen style that is available. For example, the first pen style is a solid red line, so the first tag you place in a chart has this style. You can change the default pen styles.

Changing the options does not affect tags that are already in the trend chart.

### To configure color options

1. On the **Tools** menu, click **Options**. The **Options** dialog box appears.
2. Click the **Colors** tab.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




3. To use the default pen styles for the tags in a trend, select either **Use default colors for new tags** or **Use Engineering Unit Dimension colors for new tag**. Go to step 10.
4. To configure one or more pen styles, select **Custom**.
5. Select a pen number from the list.
6. Click the **Color** box and select or configure a color for the pen line.
7. In the **Width** list, select the width, in pixels, of the pen line.
8. In the **Style** box, select the style of the pen, either a solid line or one of a variety of dashes.
9. Repeat steps 5 through 8 for each pen style you want to configure.
10. Click **OK**.

## Configuring Time Zone Options

You can configure Trend so that data appears with time stamps that reflect any time zone. For example, you may want to configure the Trend to the same time as the location of the server.

### To configure time zone options:

1. On the **Historian** tab, in the **Publish** group, click **Options**, and then click **Options**. The **Options** dialog box appears.
2. Select the **Time Zone** tab. The grid displays the current time zone and daylight saving time settings for the following entities:

| Entity | Description |
|---|---|
| Application | The Historian Client Workbook application.<br>You can select the time zone for the data as it appears in the Workbook application. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Entity | Description |
|---|---|
| Client | The physical computer on which the Workbook application is installed.<br>The time zone displayed for the client is for informational purposes only and cannot be changed using the Workbook application. |
| <Server> | The Historian(s) to which the Workbook application is currently connected.<br>The time zone displayed for the server(s) is for informational purposes only and cannot be changed using the Workbook application. |

3. In the **Time zone** list, click the name of the time zone to use for the Workbook application.

   The time zone for the Workbook application in the grid displays the new time zone picked.

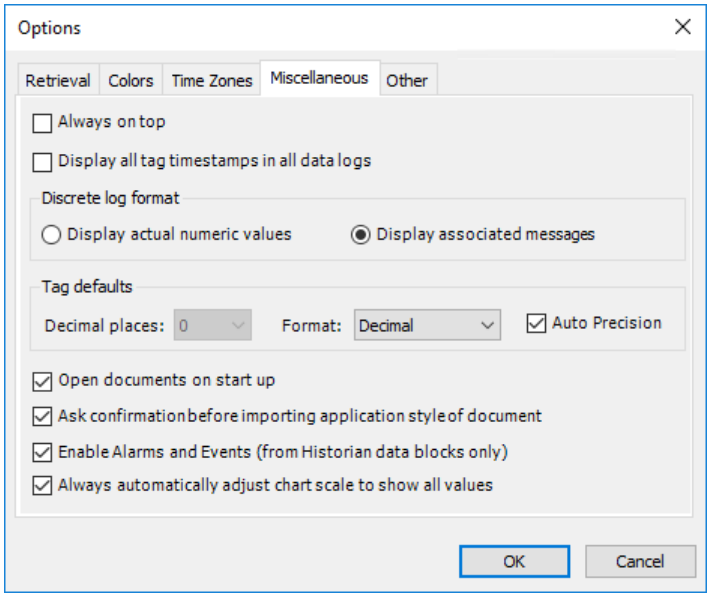
   For example, consider a SCADA application that monitors a pipeline between Houston, Texas and Lake Forest, California. The Workbook application is installed on a computer located in Houston, Texas. Therefore, the time zone entry for the Client entity displays Central Standard Time. The server is also located in Houston, Texas. The time zone entry for the Server entity also displays Central Standard Time. You want to send a Workbook file to an engineer located at the start of the pipeline in Lake Forest to aid in troubleshooting a problem. You can set the time zone of the Workbook application to reflect the time of Lake Forest, California (Pacific Standard Time), so that the workbook that you send to the engineer displays data in a time zone that is relevant to him/her.

4. Click **OK.**

## Configuring Miscellaneous Options

### To configure miscellaneous options

1. On the **Tools** menu, click **Options**. The **Options** dialog box appears.
2. Click the **Miscellaneous** tab.




3. Select **Always on top** to always display Trend as the top-most program on the computer desktop.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

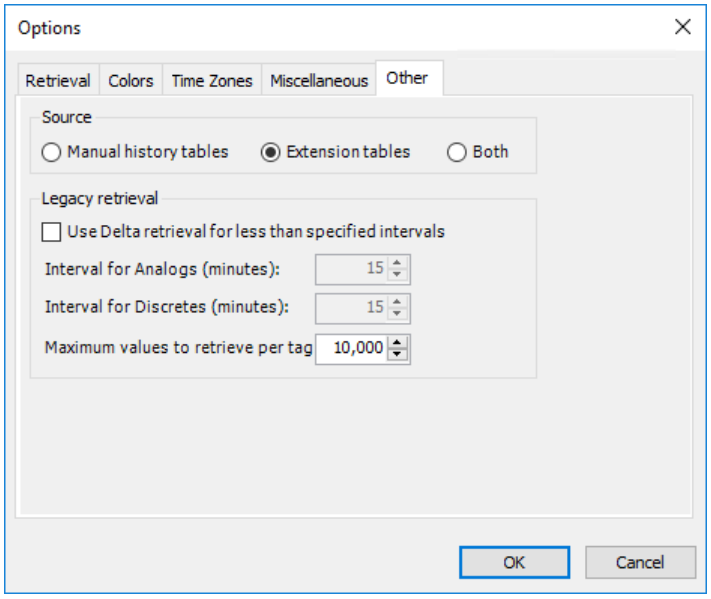
4. Select **Display all tag timestamps in all data logs** to include the time stamps for all tags in the data log.
5. In the **Discrete log format** area, configure how the values for discrete tags appear in the data log. Select **Display actual numeric values** to show the numeric value for the discrete tag, either 1 for the TRUE state or 0 for the FALSE state. Select **Display associated messages** to show the text associated with the TRUE or FALSE state of the discrete tag. For example, "On" or "Off," "Started" or "Stopped."
6. In the **Tag defaults** area, configure how tag values appear in the chart. Changes to these settings are not applied until the next tag is added to the chart.
   - Decimal places — The number of values that appear to the right of the decimal period.
   - Format — The format for tag values, either decimal format or scientific format. For the scientific format, the value appears with an E denoting the exponent.
   - Auto Precision — If selected, the number of decimal places is automatically set based on the value range. When Auto Precision is selected, the Decimal places field is read-only.
7. Configure the following additional options:
   - Open documents on start up — If selected, when you start the Trend application, it automatically reopens the trend files that were open when you closed it. Otherwise, a new trend file is created.
   - Ask confirmation before importing application style of document — Some style information is saved in trend files, and this may differ from the default styles configured in the Trend application. If this option is selected, when you open a trend file you will be prompted to confirm whether or not to override the default settings with the settings from the trend file. Otherwise, the settings from the trend file will override the default settings automatically, with no confirmation required.
   - Enable Alarms and Events (from Historian data blocks only) — Select this option to enable the alarms and events overlay in the trend chart.
   - Always automatically adjust chart scale to show all values — If this option is selected, when trend values cross the chart boundaries, the Trend application will automatically adjust the chart scale so that all values are displayed.
8. Click **OK**.

## Configuring Other Options

### To configure other options

1. On the **Tools** menu, click **Options**. The **Options** dialog box appears.
2. Click the **Other** tab.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




3. In the **Source** area, specify the Historian tables from which data will be retrieved.

   - Manual history tables — Normal SQL Server tables that are used to store data. These are the ManualAnalogHistory and ManualDiscreteHistory tables.
   - Extension tables — Logical tables that are populated from the Historian data files. These tables support the Historian time domain extensions for handling data.
   - Both — Select this option to retrieve data from both the manual and extension tables.

4. In the **Legacy retrieval** area, specify the retrieval mode for data that is retrieved from the Historians with a version earlier than 9.0.

   For information on how these settings interact with a retrieval style that you may have selected, see Working with Retrieval Styles.

   - Use Delta retrieval for less than specified intervals — Select this check box to use delta retrieval mode for query time periods that are less than a specified amount.
   - Interval for Analogs — The time period, in minutes, for which delta values are retrieved for analog tags. For greater time periods, cyclic retrieval is used instead. Valid values are 0 to 250,000. The default value is 15.
   - Interval for Discretes — The time period, in minutes, for which delta values are retrieved for analog tags. For greater time periods, cyclic retrieval is used instead. Valid values are 0 to 10,000. The default value is 15.
   - Maximum values to retrieve per tag — The maximum number of values to return per tag. Valid values are 0 to 30,000. The default value is 10,000.

5. Click **OK**.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Configuring Trend File Properties

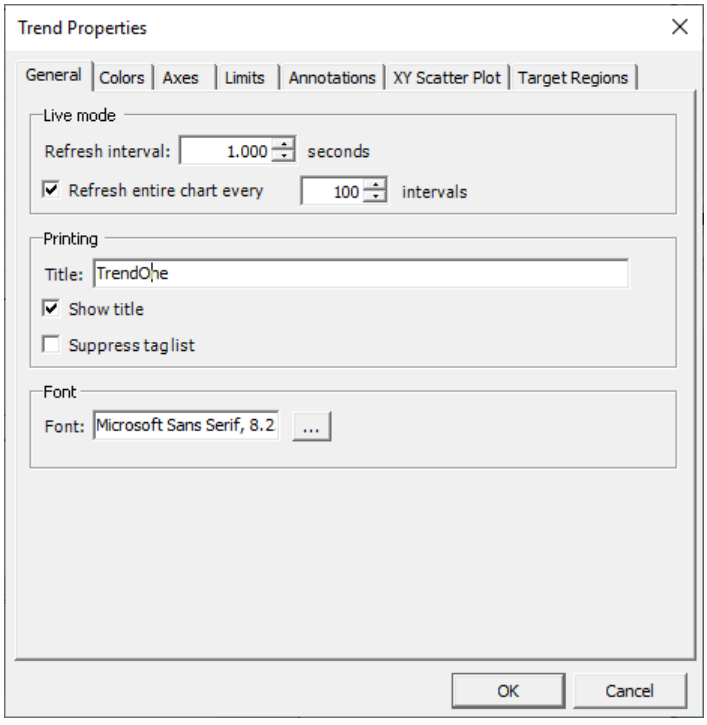
The trend properties enable you to configure a trend file. Trend file properties are saved with the trend file. Categories of trend properties that can be configured include:

- Configuring General Properties
- Configuring Color Properties
- Configuring Axis Properties
- Configuring Limit Properties
- Configuring Annotation Properties
- Configuring Target Region Properties

## Configuring General Properties

### To configure general properties

1. On the **Chart** menu, click **Properties**. The **Trend Properties** dialog box appears.
2. Select the **General** tab.




3. In the **Refresh interval** box, specify the time period, in seconds, at which the chart is refreshed if set to live mode. Valid values are 0.25 to 300. The default value is 1.
4. In the **Refresh entire chart every XX intervals** box, specify the number of refresh intervals after which the entire chart is refreshed. The chart is not only refreshed with the new live data, but all the data in the chart is refreshed. Valid values are 1 to 100,000. The default is 100.
5. In the **Printing** area, configure options for chart printing.
    - **Title:** The title of the chart.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

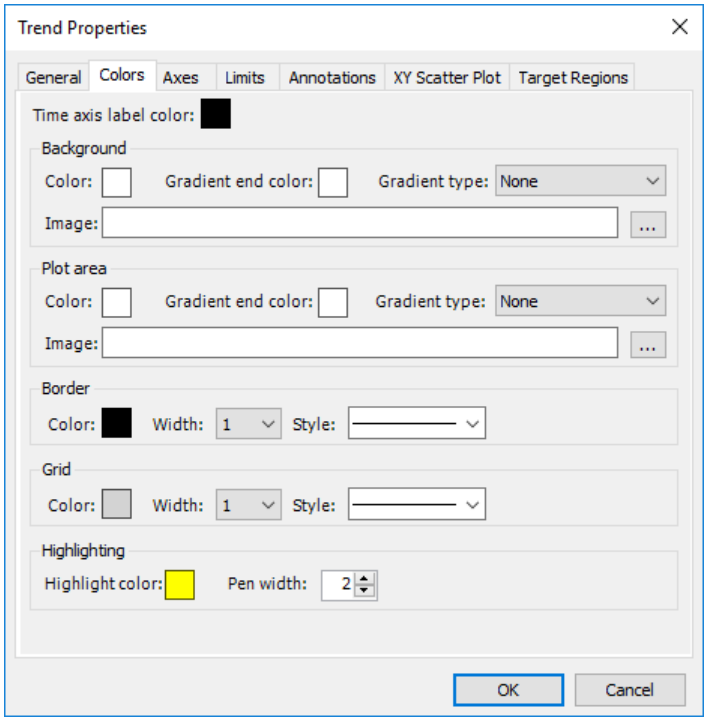
- **Show title:** Show the title in the printout.
- **Suppress tag list:** Do not include the tag list in the printout.

6. In the **Font** area, click the **Font** icon to select the name, style, and size of the font that is to be displayed on the chart and Tag List.
7. Click **OK**.

## Configuring Color Properties

### To configure color properties

1. On the **Chart** menu, click **Properties**. The **Trend Properties** dialog box appears.
2. Click the **Colors** tab.




3. Click the **Time axis label color** box to select or configure the color for the time labels that appear at the bottom of the chart.
4. In the **Background** area, configure the colors or image to use for the background of the entire chart area.
   - **Color:** Click to select or configure a main color. If you are using a gradient fill, this is the starting color for the gradient.
   - **Gradient end color:** Click to select the ending color for the gradient. The gradient starts with the main color and fade to the gradient end color.
   - **Gradient type:** The starting point for the flow of the gradient. Valid values are Center, Diagonal Left, Diagonal Right, Horizontal Center, Left Right, Top Bottom, and Vertical Center. For example, if you select green as main color, white as the gradient end color, and center as the gradient type, the center of the chart is green and fades to white towards the surrounding edges.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

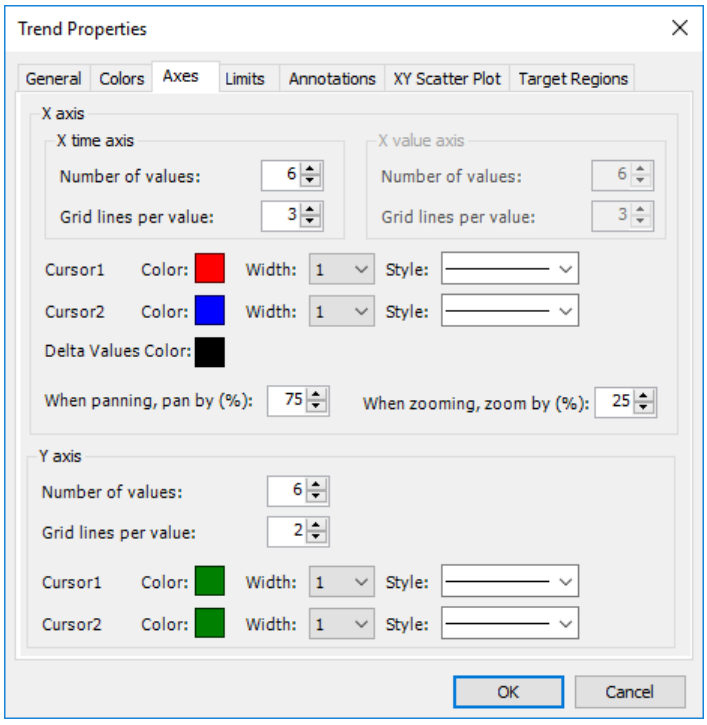
- **Image:** The name of the image to use as the background. The image is resized to fit within the chart area. The color of the pixel in the lower left corner of the image is used as the transparency mask for the image. Click the ellipses button to browse for and select an existing image.

5. In the **Plot** area, configure the colors or image to use for the chart plotting area. Options are the same as for the **Background** colors.
6. In the **Border** area, configure the appearance of the chart's border.
   - **Color:** Click to select or configure a color.
   - **Width:** The width, in pixels, of the border line.
   - **Type:** The style of the border line.
7. In the **Grid** area, configure the color for the grid lines of the chart. Options are the same as for **Border**.
8. In the **Highlighting** area, configure the color and pen width to be used for tag highlighting.
   - **Highlight color:** Click to select or configure a color for highlighting the tag curve.
   - **Pen width:** Specify how wide (in pixels) a highlighted curve should be.
9. Click **OK**.

## Configuring Axis Properties

### To configure axis properties

1. On the **Chart** menu, click **Properties**. The **Trend Properties** dialog box appears.
2. Select the **Axes** tab.




3. In the **X axis** area, configure the properties for the horizontal axis.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- **Number of values:** The number of values that are shown along the time axis. The values are shown at evenly-spaced points along the axis. The number of values remain the same even if you zoom in and out. The valid range is from 2 to 15, with a default value of 6.
- **Grid lines per value:** The number of grid lines that appear between each tag value plotted on the chart. The valid range is from 1 to 20, with a default value of 3.
- **Cursor1 Color, Cursor2 Color:** Click to select or configure the color for each time axis cursor.
- **Delta Values Color:** Click to select or configure the color of the Delta cursor label displayed above the plot area in the upper-right corner.
- **Width:** The width of each time axis cursor.
- **Style:** The line style for each time axis cursor.
- **When panning, pan by:** The percentage used for the panning scale. The panning scale range is from 1 to 100.
- **When zooming, zoom by:** The percentage used for the zoom. The zoom factor range is from 1 to 100.

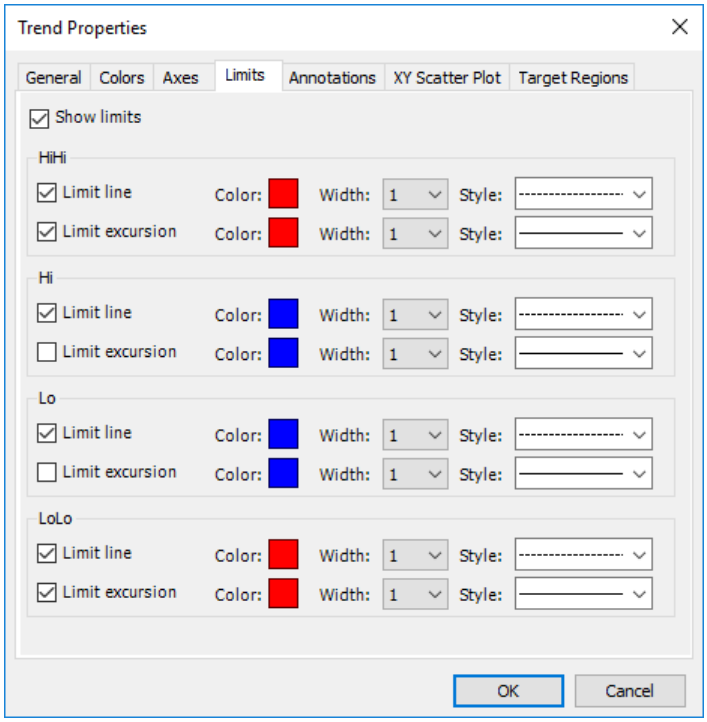
4. In the **Y axis** area, configure the properties for the vertical axis.
   - **Number of values:** The number of values that are shown along the value axis. The time stamps are shown at evenly-spaced points along the axis. The number of values remain the same even if you zoom in and out. The valid range is from 2 to 15, with a default value of 6.
   - **Grid lines per value:** The number of grid lines appearing between each tag value that is plotted on the chart. The valid range is from 1 to 20, with a default value of 3.
   - **Color:** Click to select or configure the color for each value axis cursor.
   - **Width:** The width of each value axis cursor.
   - **Style:** The line style for each value axis cursor.
5. Click **OK**.

## Configuring Limit Properties

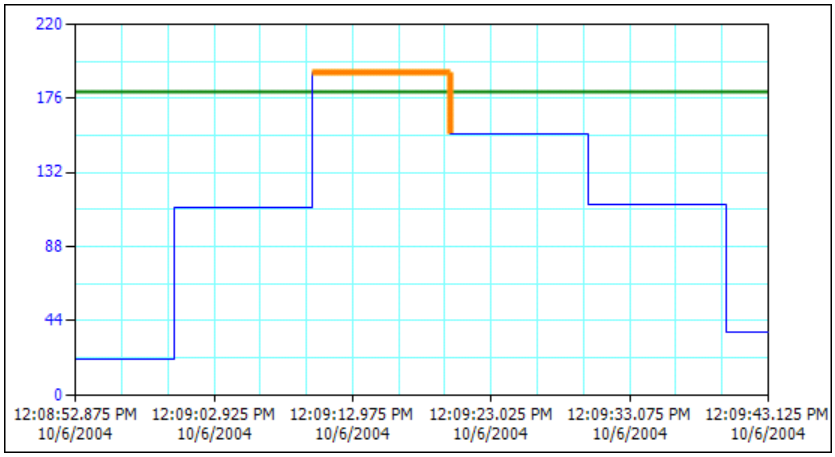
### To configure limit properties

1. On the **Chart** menu, click **Properties**. The **Trend Properties** dialog box appears.
2. Select the **Limits** tab.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




3. Select the **Show Limits** check box to show horizontal lines on the chart at the limit values configured for analog tags.



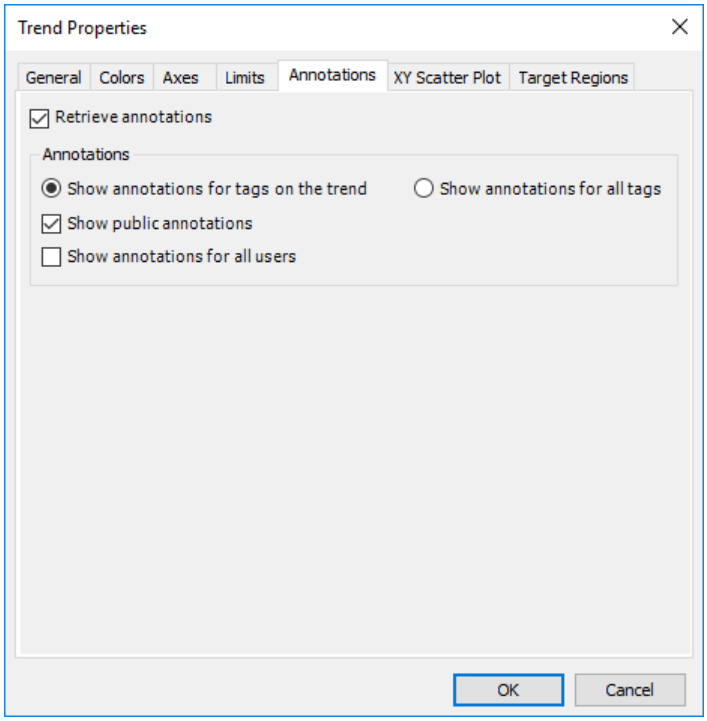

4. For each type of limit (HiHi, Hi, Lo, and LoLo), configure the properties of the line.
   - **Limit line:** Select to include a line on the chart for the limit value. For example, if an analog tag has a Hi limit of 1800, a horizontal line is drawn at the 1800 mark on the vertical axis.
   - **Limit excursion:** Select to indicate the portion of the trace that is outside of the limit.
   - **Color:** The color of the line.
   - **Width:** The width of the line.
   - **Style:** The style of the line.
5. Click **OK**.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

## Configuring Annotation Properties

### To configure annotation properties

1. On the **Chart** menu, click **Properties**. The **Trend Properties** dialog box appears.
2. Select the **Annotations** tab.




3. Select the **Retrieve annotations** check box to retrieve annotation information and show them on the chart.
4. In the **Annotations** area, configure how annotations are shown on the chart.
   - **Show annotations for tags on the trend:** Show only the annotations for the tags currently charted in the trend.
   - **Show annotations for all tags:** Show all annotations for all tags. For those tags not currently charted on the trend, the annotation marker appears at the top of the chart at the point in time on chart at which the annotation was made.
   - **Show public annotations:** Show only public annotations. You can see your private annotations and the public annotations of other Historian users.
   - **Show annotations for all users:** Show both public and private annotations. You can see your private annotations, as well as both the public annotations and private annotations of others.
5. Click **OK**.

For information on the **XY Scatter Plot** tab, see Configuring Scatter Plot Properties.

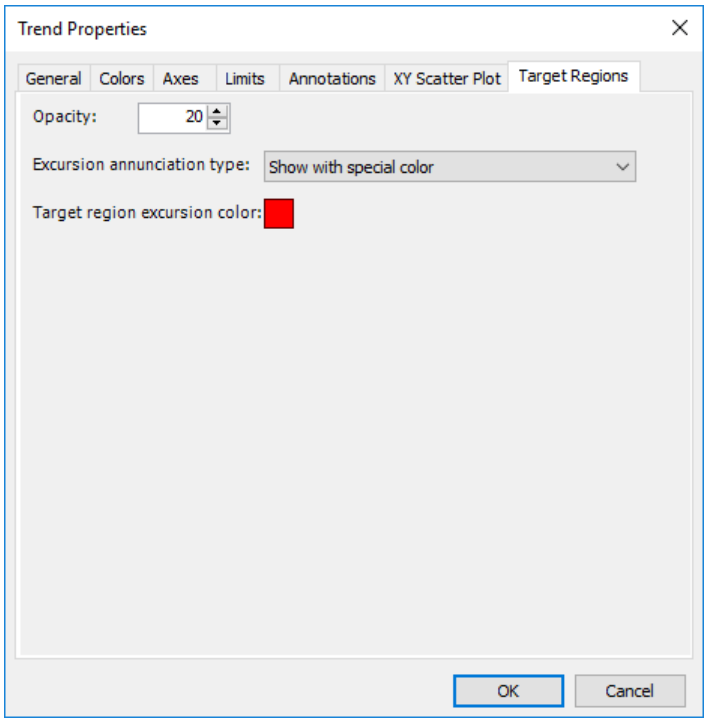
## Configuring Target Region Properties

### To configure target region properties

1. On the **Chart** menu, click **Properties**. The **Trend Properties** dialog box appears.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

2. Select the **Target Regions** tab.




3. In the **Opacity** box, enter the opacity with which you want the target region to appear on the trend chart.
4. In the **Excursion annunciation type** list, specify whether values that fall outside the target region should be highlighted. Select **Show with special color** to highlight parts of the trend graph that are outside the target region in a special color. To select the color, click the color box next to **Target region excursion color**. Select **None** if you do not want any special highlighting.
5. Click **OK**.

## Configuring a Trend to Use a Summary Tag

Summary tags consist of summarized data of tags from a Historian server. A summary tag provides an aggregation calculation (minimum, maximum, average, or sum) that is configured on a Historian server. Summary tags are of two types: analog and state.

- Analog summary tags provide summary statistics for analog tags.
- State summary tags provide the summaries of the states of the tag value of analog (integer only), discrete, and string tags.

You can select one or more summary tags from the Tag Picker and drag them to the Tag List pane. When you drag a summary tag to the Tag List, the Trend application plots the value of the aggregate calculation on the Trend chart. The aggregate calculation is performed when you configure the summary tag on the Historian server. For example, if you have configured a ReactTemp_Avg_Hourly summary tag to store the hourly averages of the Reactor temperature, the Trend application shows the hourly average value of the Reactor temperature when you drag and drop the ReactTemp_Avg_Hourly tag to the Trend chart. For more information on the Tag List pane, see Viewing Tag Definition Information.

You can configure trend options for a summary tag. For more information, see Configuring Trend Options for a Tag.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

For more information on retrieving summary tags, see Configuring Retrieval Options for a Tag or Configuring Retrieval Options.

# Using Absolute or Relative Times

The following time modes are available for the trend chart:

- Absolute time
- Relative time

The time mode selection is saved as part of the chart definition when you save the .aaTrend file.

## Using Absolute Time

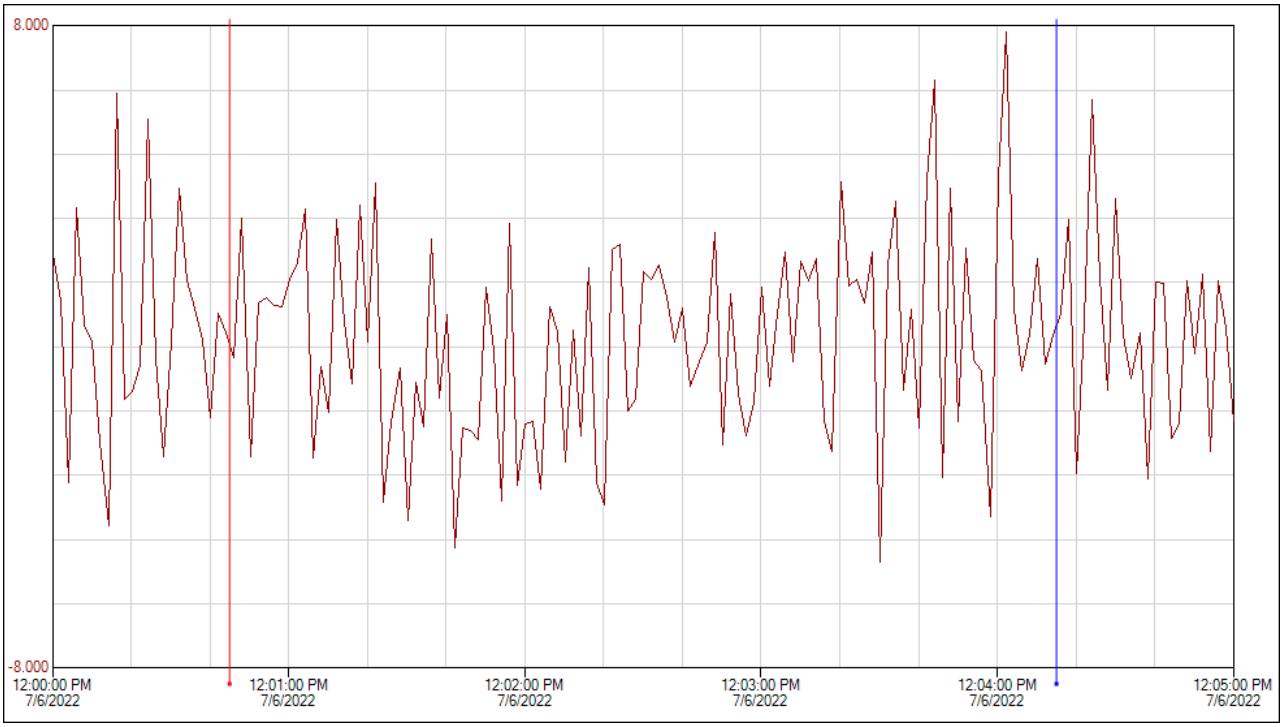
In absolute time mode, you determine the time period for the query by setting a combination of the start time, duration, and end time.

**To use absolute time**

On the **View** menu, in the **Time** group, select **Absolute**.

For example, the following chart shows five minutes of data in absolute time.

The query for the data starts at 12:00:00 and ends at 12:05:00, and the time axis values reflect these times.




In absolute time mode:

- The times shown for the time axis cursors, if enabled, are absolute times.
- The times shown in the Time Bar are absolute times.
- The time offset for each tag can be configured in the Tag List. For more information, see Using Time Offsets to Compare Data in Absolute Time.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

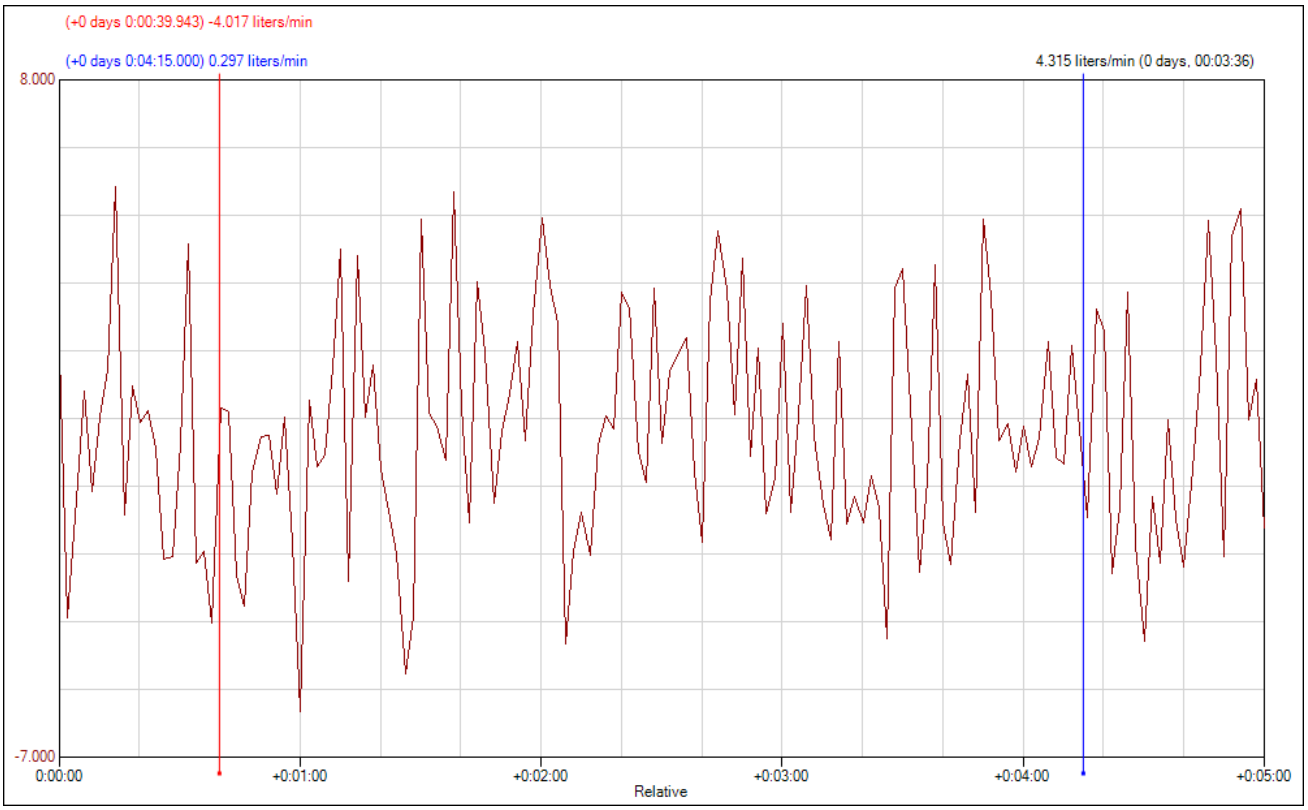
## Using Relative Time

For the relative time mode, a base value (such as 0:00:00.0) is used for the start time of the chart, and the end time is calculated based on the time span for the query. Switching to relative mode does not change the data shown in the chart nor the actual start and end time of the trend query. Only the time axis is updated.

### To use relative time

On the **View** menu, in the **Time** group, select **Relative**.

For example, the following chart shows five minutes of data in relative mode. The query for the data starts at 12:00:00 and ends at 12:05:00, but the time axis shows a start time of 0:00:00 and an end time of +0:05:00.




In relative time mode:

- The times shown for the time axis cursors, if enabled, are relative times. For details on the display format for times, see Time Offset Formats.
- The time fields in the Time Bar are relative times. The first field is the base time (for example, 0:00:00.000), and the second field is the timespan of the query. The third field is the end time of the query (the base time plus the timespan). To offset the time for the query, adjust the base time (for example, 1:00:00.000 to offset it by +1 hour).
  The first field (the base time) defaults to 0:00:00 when you switch to relative mode.
- The Tag List shows the actual start time for the tag data in the Start Time column.
- The **Tag Properties** dialog box shows the start time option. For more information, see Configuring Trend Options for a Tag.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

## Switching Between Absolute and Relative Time: Example

When you change the time mode, the Time Bar and individual tag time settings convert between absolute times and relative offsets.

The following table summarizes the states for the Time Bar and three tag offsets/dates for some example data. Tag1 is the currently selected tag. In this example, the actions performed for the different steps are:

1. At exactly 2005-07-04 10:00, "2 hours" is selected from the Time Bar while the **Update to Current Time** option is enabled. The chart is in absolute mode.
2. The chart is switched to relative time mode.
3. The start and end values are changed in the Time Bar.
4. The chart is switched back to absolute time mode.

| **Step:** | **1** | **2** | **3** | **4** |
|---|---|---|---|---|
| Mode: | Absolute | Relative | Relative | Absolute |
| Time Bar Start: | 2005-07-04 8:00 | 0:00 | -0:15 | 2005-07-04 7:45 |
| Time Bar End: | 2005-07-04 10:00 | 2:00 | 0:45 | 2005-07-04 8:45 |
| Tag1: | - 24:00 | 2005-07-03 8:00 | 2005-07-03 8:00 | - 24:00 |
| Tag2: | 0:00 | 2005-07-04 8:00 | 2005-07-04 8:00 | 0:00 |
| Tag3: | +3:30 | 2005-07-04 11:30 | 2005-07-04 11:30 | +3:30 |
| Time Axis Start: | 2005-07-03 8:00 | 0:00 | -0:15 | 2005-07-03 7:45 |
| Time Axis End: | 2005-07-03 10:00 | 2:00 | 0:45 | 2005-07-03 8:45 |

### Time Offset Formats

The application displays time offsets in the following formats:

[±][d]hh:mm[:ss[.fff]]

-OR-

[±]HH:mm[:ss[.fff]]

-OR-

[±]d[.FF]

Items in square brackets ([ and ]) are optional. Colons and periods (: and .) are literal characters.

The notation variables are as follows.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Item | Description |
|---|---|
| ± | Minus sign indicating a negative time. Positive time is assumed. |
| d | Days |
| hh | Hours, ranging from 0 to 23. |
| HH | Hours of 24 or greater. |
| mm | Minutes, ranging from 0 to 59. |
| ss | Seconds, ranging from 0 to 59. |
| fff | Fractional seconds, from 1 to 7 decimal digits. |
| FF | Fractional days. |

Time offsets are shown in the application in either a short or long form:

Short form: HH:mm:ss.ff or d hh:mm:ss.fff

Long form: d <label> hh:mm:ss.fff

In the short form:

- "d" is omitted for offsets less than or equal to 48 hours
- ".fff" is omitted for offsets greater than 60 seconds
- ":ss.fff" is omitted for offsets greater than 24 hours

Thus, for periods of less than 60 seconds, the short form is never longer than 11 characters. For the short form, the hours in HH format (rollover at 48 instead of 24) are shown only if days are not to be displayed anywhere on the time axis.

The "<label>" is the localized word for "days" or "day." The period (.) and colon (:) are replaced with the appropriate characters from the regional settings.

## Using Time Offsets to Compare Data in Absolute Time

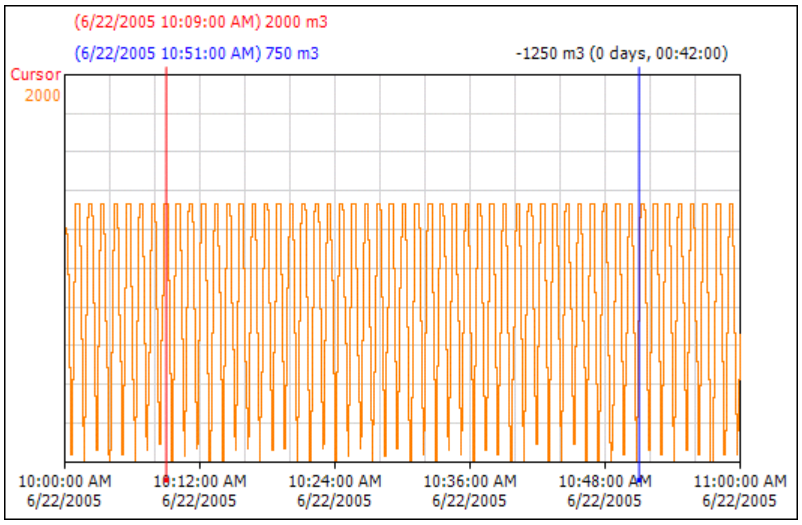
In absolute time mode, you can use a time offset to compare the same data from different time periods. For example, you may want to compare data from a shift at 10:00 a.m. to data from a shift at 11:00 a.m. The time offset feature enables you to adjust the time period for one of the shifts so that the data appears as if it occurred during the same time period as the other shift. Using a time offset enables you to easily see the differences between the data on the trend chart.

**To use a time offset**

1. Create a trend for batch of data that you want to use as the basis for comparison.

   In this example, the chart is configured to show data for the ReactLevel tag between 6/22/2005 10:00:00 AM and 6/22/2005 11:00:00 AM.

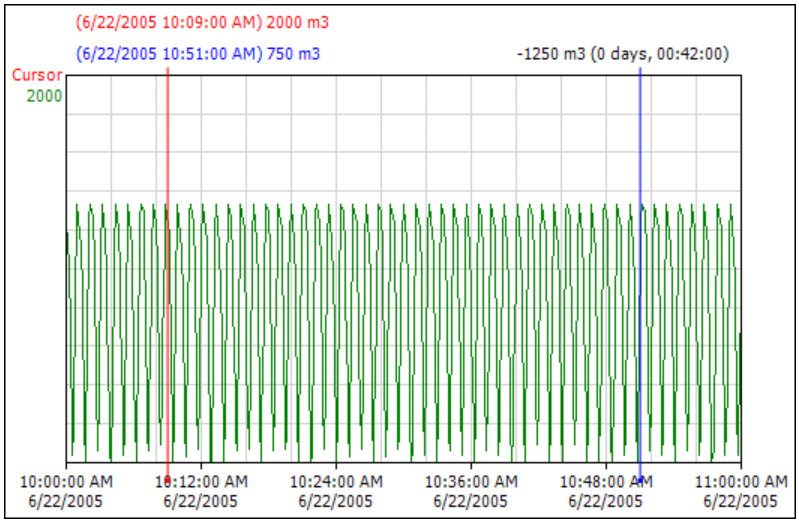
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




2. Add the same tag again to the trend chart for the same time period.

   In this example, the ReactLevel tag was added again to the chart.

3. Because the data is identical, you only see single trend curve in the chart.



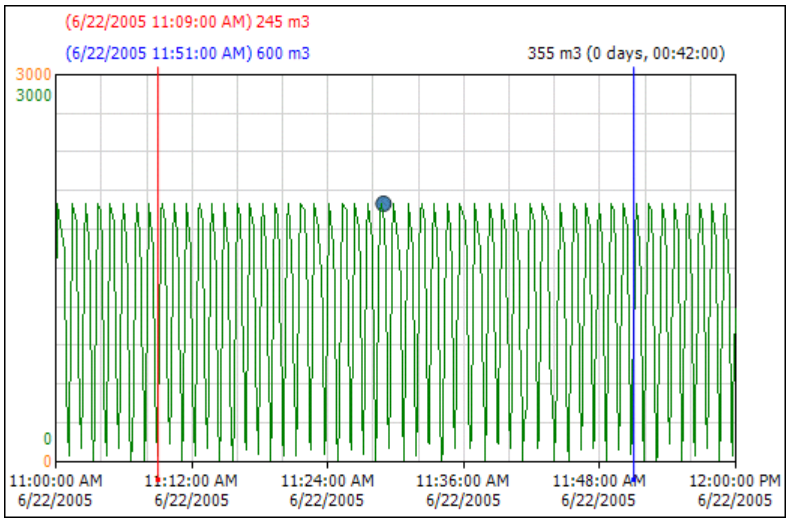

4. Determine the time span for the data you want to compare with the base batch of data.
5. To specify the time offset for the data to compare, double-click on the tag in the Tag List. The **Tag Properties** dialog box appears.
6. In the **Time offset** box, configure the amount of time that the data shown in the chart is to be offset from the actual query time. For more information on the format, see Time Offset Formats.

   In this example, this data is to be compared with the base batch that occurred an hour before, so the time offset is set to one hour.

7. Click **OK**.

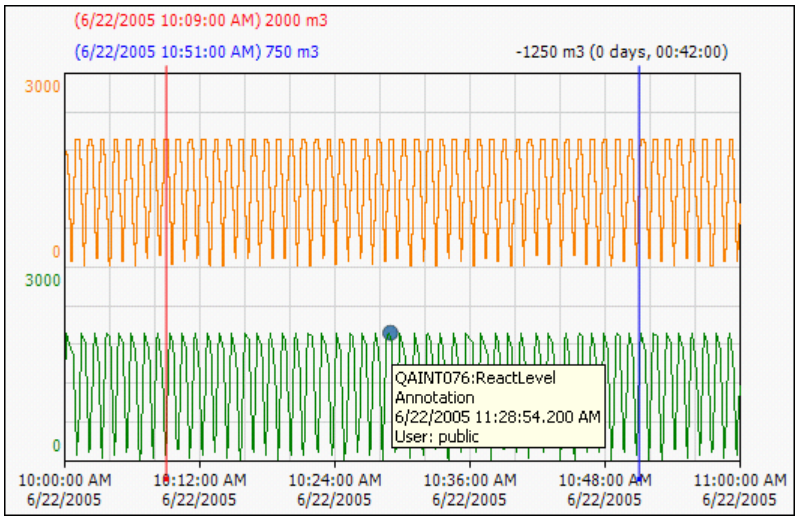
   In this example, the data for the ReactLevel tag between 6/22/2005 11:00:00 AM and 6/22/2005 12:00:00 AM includes an annotation made around 11:30:00 AM.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.



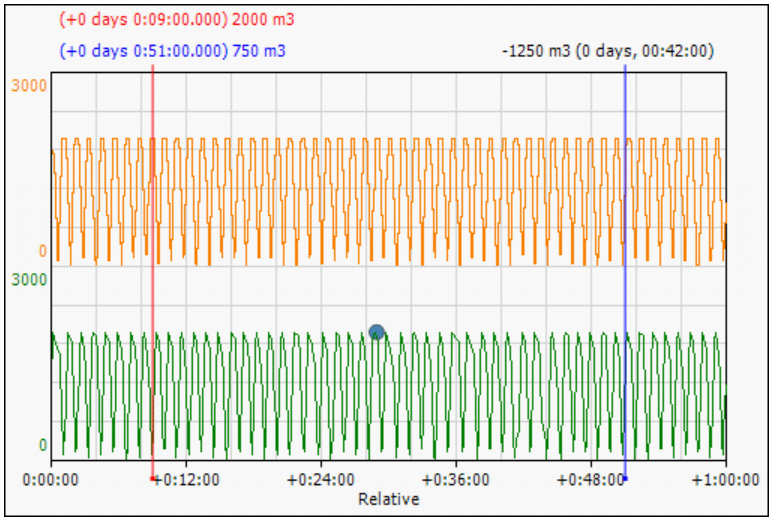

8. Stack the traces so that you can see both sets of data separately and then select the first tag that you added to the chart.

   In this example, the trend curve for the later set of data (shown in green) appears on the chart, even though the time axis reflects the time of the base batch of data (shown in orange).




9. To view the chart in relative mode, on the **View** menu, click **Relative Time**. The time axis now shows the time span for the base batch starting at 0:00:00 instead of the actual time.

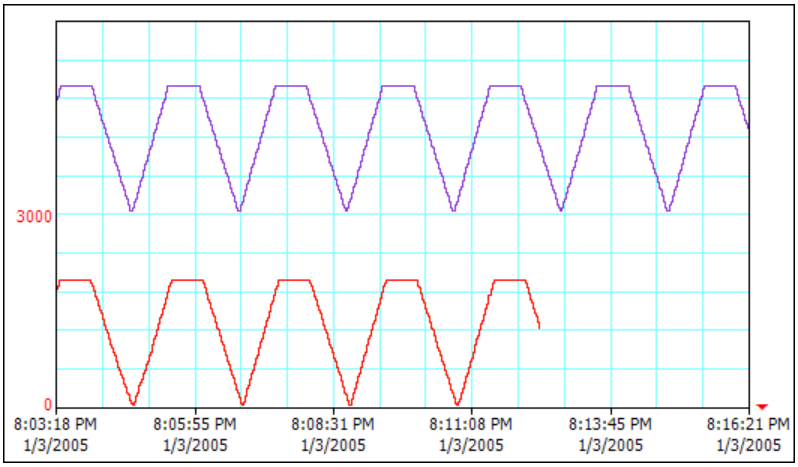
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




You can also use the offset to compare a trend curve against another curve either forward or backward in time. To do this, set the time offset of the "master" batch of data so that the start time is the same as the start time for the batch of data you want to compare.

In the following example, the time offset for the complete batch is set to a value of -01.00.44. The complete batch appears as the top curve in the chart.

The incomplete curve at the bottom of the chart is plotted in live mode next to the complete curve at the top.




## Working with Replicated Tags

You can replicate tag information in a Historian from one Historian to another. This allows you to replicate tag data from one or more Historians (known as tier-1 historians) to one or more other historians (known as tier-2 historians). You can replicate tag data to the same server as the tier-1 historian.

You can replicate tag data directly using simple replication, where the tag information is replicated directly to the tier-2 historian. For simple replication, every value for a tag is copied. You can also set up summary tags that receive a summarized version of the tag data.

You can drill down from a source tag to its replicated tag or drill up from a replicated tag to its source tag. You can add a source tag with its replicated tag or a replicated tag with its source tag in the active trend chart. You

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

can also replace a source tag with its replicated tag or a replicated tag with its source tag in the active trend chart.

## Adding a Source Tag or Replicated Tag

You can select a source tag or replicated tag from the Tag Picker to add the corresponding replicated tag or source tag to the active trend chart.

**To add a source tag or replicated tag**

1. Select a tag in the Tag Picker.
2. If the selected tag is a source tag, do the following:
   - In the **Tags** pane, right-click the selected tag, then select **Add - replicated tag**, and then select the tag that you want to add to the trend chart. The corresponding replicated tag is added to the active trend chart.
3. If the selected tag is a replicated tag, do the following:
   - In the **Tags** pane, right-click the selected tag, and then click **Add - source tag**. The corresponding source tag is added to the active trend chart.

The **Add** command is not available if:

- Multiple tags are selected in the Tag Picker.
- A normal tag that is neither a source tag nor a replicated tag is selected in the Tag Picker.

**Note:** You cannot execute the **Add** command if a source tag is deleted but its replication configuration still exists in the Historian.

The replicated tags are not listed in the context menu if:

- The replicated tags are not committed in the Historian.
- The replication schedule is removed from the Historian. For example, you are connected to a Historian 10.0 server and you create a tag called ‘MyTag’. ‘MyTag’ is replicated as a simple tag called ‘MyServer.MyTag’. When you execute the **Add - replicated tag** command, the ‘MyServer.MyTag’ tag is shown. When you execute the **Add - source tag** command, the ‘MyTag’ tag is shown. At this instance, if the replication link between ‘MyTag’ and ‘MyServer.MyTag’ is removed and if you execute the **Add - replicated tag** command, the ‘MyServer.MyTag’ tag is not shown in the list of replicated tags.

  However, if you execute the **Add - source tag** command, the ‘MyTag’ tag is shown as ‘MyTag’. If ‘MyServer.MyTag’ is the only replicated tag, ‘MyTag’ is considered as a normal tag.

  The above scenario holds true if the entire replication schedule is removed in the Historian. If only one replication is removed, the list shows the remaining replicated tags.

## Finding a Source Tag or Replicated Tag

You can select a source tag or replicated tag from the Tag Picker to find the corresponding replicated or source tag.

**To find a source tag or replicated tag**

1. Select a tag in the Tag Picker.
2. If the selected tag is a source tag, do the following:

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- In the **Tags** pane, right-click the selected tag, point to **Find - replicated tag**, and then click the tag that you want to find.

  The application navigates within the Tag Picker to find the corresponding replicated tag.

3. If the selected tag is a replicated tag, do the following:
   - In the **Tags** pane, right-click the selected tag, and then click **Find - source tag**.

     The application navigates within the Tag Picker to find the corresponding source tag.

The **Find** command is not available if:

- Multiple tags are selected in the Tag Picker.
- A normal tag that is neither a source tag nor a replicated tag is selected in the Tag Picker.

**Note**: You cannot execute the **Find** command if a source tag is deleted but its replication configuration still exists in the Historian.

The replicated tags are not listed in the context menu if:

- The replicated tags are not committed in the Historian.
- The replication schedule is removed from the Historian. For example, you are connected to an Historian 10.0 server and you create a tag called 'MyTag'. 'MyTag' is replicated as a simple tag called 'MyServer.MyTag'. When you execute the **Find - replicated tag** command, the 'MyServer.MyTag' tag is shown. When you execute the **Find - source tag** command, the 'MyTag' tag is shown. At this instance, if the replication link between 'MyTag' and 'MyServer.MyTag' is removed and if you execute the **Find - replicated tag** command, the 'MyServer.MyTag' tag is not shown in the list of replicated tags. However, if you execute the **Find - source tag** command, the 'MyTag' tag is shown as 'MyTag'. If 'MyServer.MyTag' is the only replicated tag, 'MyTag' is considered as a normal tag.

  The above scenario holds true if the entire replication schedule is removed in the Historian. If only one replication is removed, the list shows the remaining replicated tags.

## Replacing a Source Tag or Replicated Tag

You can replace a source tag with its replicated tag or a replicated tag with its source tag in the active trend chart.

### To replace a source tag or replicated tag

1. Select a tag in the Tag List.
2. If the selected tag is a source tag, do the following:
   - Right-click the selected tag, point to **Replace with replicated tag**, and then click the tag that you want to replace with.

     The source tag is replaced by the selected replicated tag in the Tag List and in the active trend chart without changing the pen configuration such as the pen color, width, or retrieval mode.
3. If the selected tag is a replicated tag, do the following:
   - Right-click the selected tag and click **Replace with source tag**.

     The replicated tag is replaced by the source tag in the Tag List and in the active trend chart without changing the pen configuration such as the pen color, width, or retrieval mode.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

The **Replace** command is not available if a normal tag that is neither a source tag nor a replicated tag is selected in the Tag Picker.

**Note:** You cannot execute the **Replace** command if a source tag is deleted but its replication configuration still exists in the Historian.

The following happens if you execute the **Replace** command on a tag configured as an x-axis tag in a XY Scatter Plot.

- If a tag is used as the x-axis tag, the **Replace with source tag** or **Replace with replicated tag** command replaces the x-axis tag reference. For example, a tag called 'MyTagY' is configured to have 'MyTagX' as the x-axis tag. Replacing 'MyTagX' with 'MyTagX2' changes the configuration of the 'MyTagY' and the x-axis tag is replaced by 'MyTagX2'.

The replicated tags are not listed in the context menu if:

- The replicated tags are not committed in the Historian.
- The replication schedule is removed from the Historian. For example, you are connected to a Historian 10.0 server and you create a tag called 'MyTag'. 'MyTag' is replicated as a simple tag called 'MyServer.MyTag'. When you execute the **Replace with replicated tag** command, the 'MyServer.MyTag' tag is shown. When you execute the **Replace with source tag** command, the 'MyTag' tag is shown. At this instance, if the replication link between 'MyTag' and 'MyServer.MyTag' is removed and if you execute the **Replace with replicated tag** command, the 'MyServer.MyTag' tag is not shown in the list of replicated tags.

  However, if you execute the **Replace with source tag** command, the 'MyTag' tag is shown as 'MyTag'. If 'MyServer.MyTag' is the only replicated tag, 'MyTag' is considered as a normal tag.

  The above scenario holds true if the entire replication schedule is removed in the Historian. If only one replication is removed, the list shows the remaining replicated tags.

# Work with Run Time Trend Charts

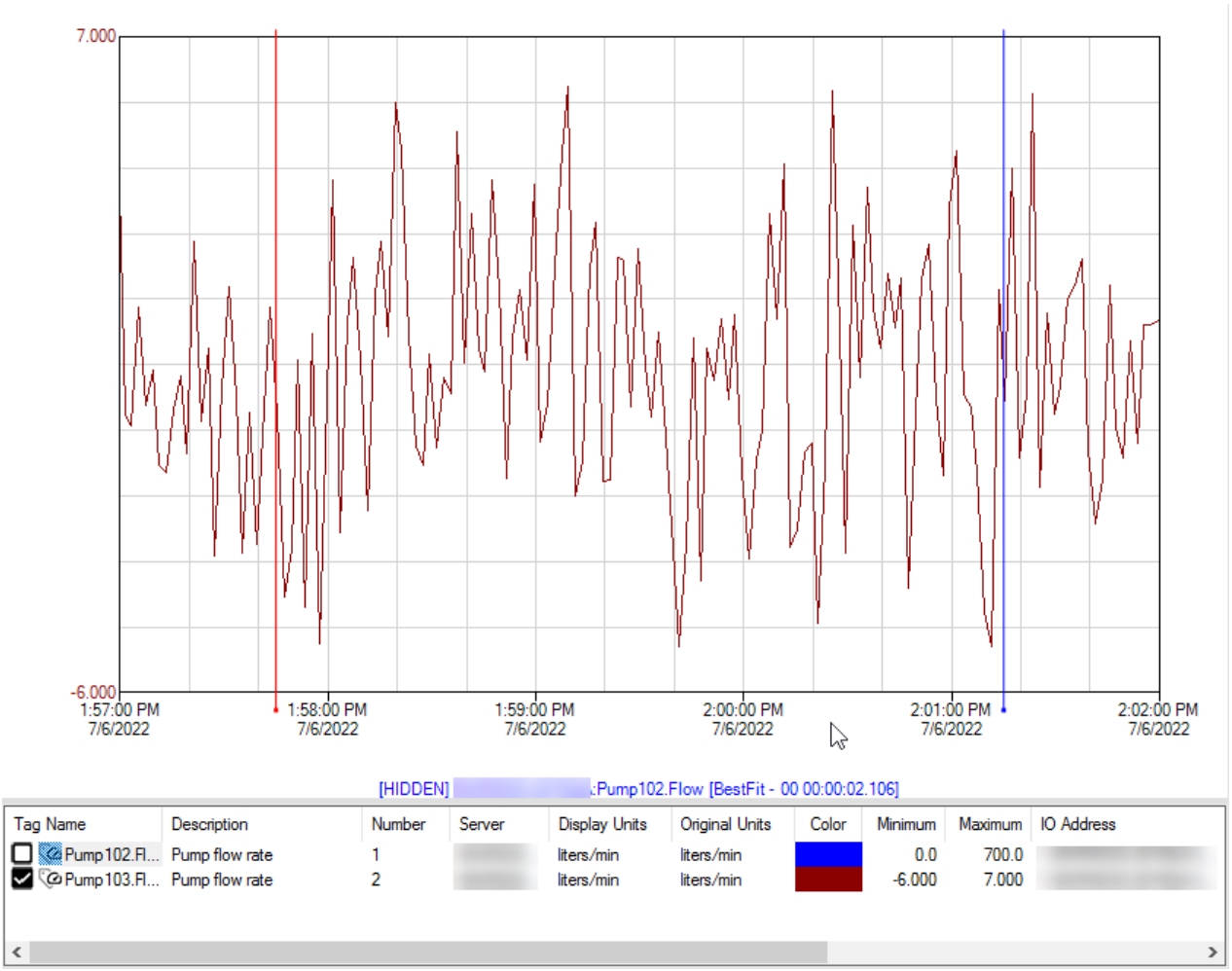
This section describes typical tasks that are completed after the HistoricalTendApp has been configured and is actively showing tag values as trends.

## Viewing Data in the Trend Chart

This section describes how to use Trend to show historical and live data for trends, as well as how to manipulate the trend display.

Information for individual tags appears in the Tag List below the chart. The name of the currently selected tag, its retrieval mode and resolution or cycle count (if applicable) appear along the bottom of the chart.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




## Refreshing the Trend Chart

You can refresh the Trend Chart to see the most recent information.

### To refresh the chart

1. Set the **Update to Current Time** toolbar button depending on whether you want the trend's time period to be updated to the current time when refreshing the chart. If the button is not available, the time period remains the same as before the update. If the button is available, the time period is updated so that it ends with the current time.
2. Do any of the following:
   - Click the **Refresh** toolbar button.
   - Right-click the chart, and select **Refresh**.

   The trend chart is updated with current data from the database.

## Deleting a Tag

You can delete a tag. Deleting a tag removes it from the chart.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### To delete a tag from the trend

1. In the Tag List, select the tag to delete.
2. Delete the tag by doing any of the following:
   - On the **Chart** menu, click **Delete Tag**. At the prompt, click **Yes**.
   - Right-click on a tag in the Tag List. In the menu that appears, click **Delete**.
   - Press the DELETE key on your keyboard.

## Configuring Trend Options for a Tag

You can configure trend options for one or more tags in the Tag List window. Trend options include the appearance of the trend pen, its target region, and the retrieval mode used to retrieve data for the tag.

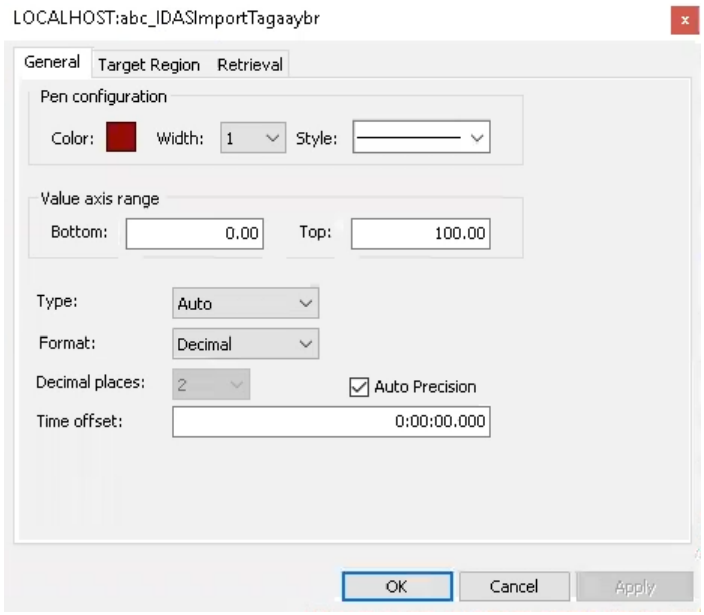
### Configuring Display Options

You can configure the pen style, value axis scale, value display options, and time offset for each tag in the chart.

### To configure display options for a tag

1. In the Tag List pane, do one of the following:
   - Right-click on the name of the tag and then click **Configure**.
   - Double-click on the name of the tag.

   The **<ServerName:Tagname>** dialog box appears with the **General** tab selected.




2. In the **Pen Configuration** area, configure the appearance of the curve for the selected tag.
   - Color — The line color of the tag. Click the colored square to select the color from a palette or define a custom color.
   - Width — The thickness of the trend curve.
   - Style — The style of the trend curve. For example, a solid or dashed line.

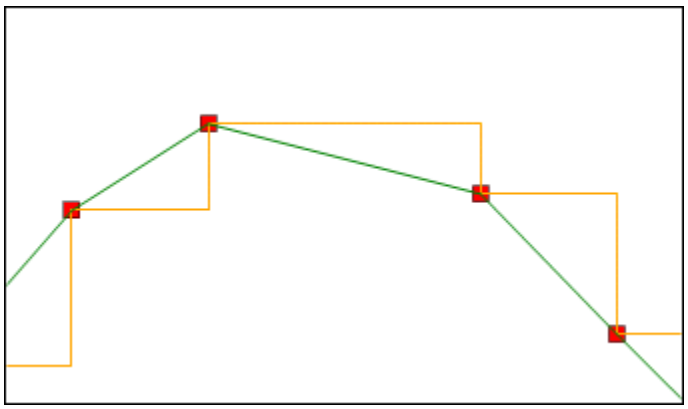
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

3. In the **Value axis range** area, configure the limits for the value axis on the chart.
   - Top — The maximum axis value for the tag, in engineering units.
   - Bottom — The minimum axis value for the tag, in engineering units.
4. In the **Type** list, select the type of trend curve to draw. Options are **Auto**, **Line**, **Step line**, and **Point**.

   A line curve is best suited for continuously-changing analog data. A step-line curve is best suited for discrete data and for analog data that is not continuous. By default, the line curve trend is selected for the summary tags.

   When you select the **Auto** option, the curve type is determined as follows:
   - For tags retrieved from a version 9.0 or a later Historian, the type is based on the tag's effective interpolation setting, which may be specified in the Trend application's retrieval settings or on the Historian. Tags that use stair-step interpolation are trended as a step line, and tags that use linear interpolation are trended as a line.
   - For tags retrieved from earlier Historian versions, the curve type is based on the tag type: step line for integer tags, and line for real tags.

   The following illustration shows the same data drawn using each type of curve. The line curve is shown in green, the step line curve is shown in orange, and the point curve is shown in red.



5. From the **Format** list, select how the values for the tag appear, either in decimal format or scientific format.
6. From the **Decimal places** list, select the number of decimal places to show for the data value of the currently selected tag. This applies only to analog tags. Valid values are 0 through 15.
7. Select **Auto Precision** to have the number of decimal places set automatically based on the value range.

   **Note: Auto Precision** is enabled by default. When auto precision is enabled, the **Decimal places** field is read-only.
8. Configure either the time offset or start time for the data.

   For more information on time offsets, see Using Absolute or Relative Times.
   - Time offset — Shown only for absolute mode. The amount of time that the trend curve of the currently selected tag will be shifted from the actual time. For information on the offset notation, see Time Offset Formats.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

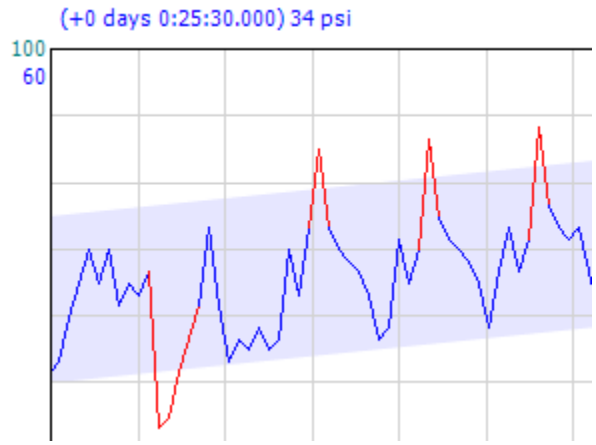
- Start time — Shown only for relative mode. The starting time stamp for the tag data in the chart.

9. Click **OK**.

### Defining a Target Region for a Tag

For each analog, discrete, or summary tag in a trend, you can define a "target region." The target region is a highlighted area of the chart into which tag values should fall during normal operation. Values that fall outside these normal limits can be highlighted in a special color, making it easy to detect them.

The following chart shows an example of a target region (the area tinted in blue). The red spikes indicate limit excursions:




In a regular trend, you can only use target regions in relative time mode. A target region is defined by "region items," that is, pairs of high and low values at specific time offsets.

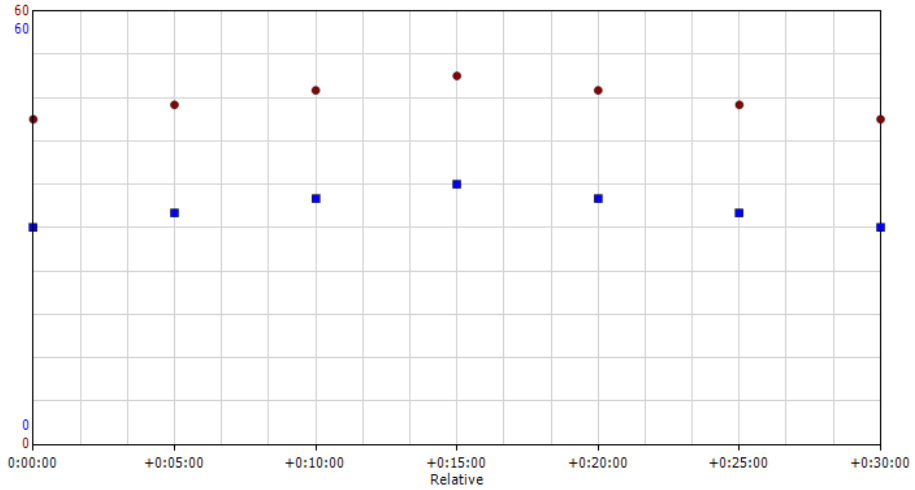
To determine the target region, a boundary is drawn that connects all of the high values, and another boundary that connects all of the low values. The area between these two boundaries constitutes the target region.

For example, assume that you define the following region items:

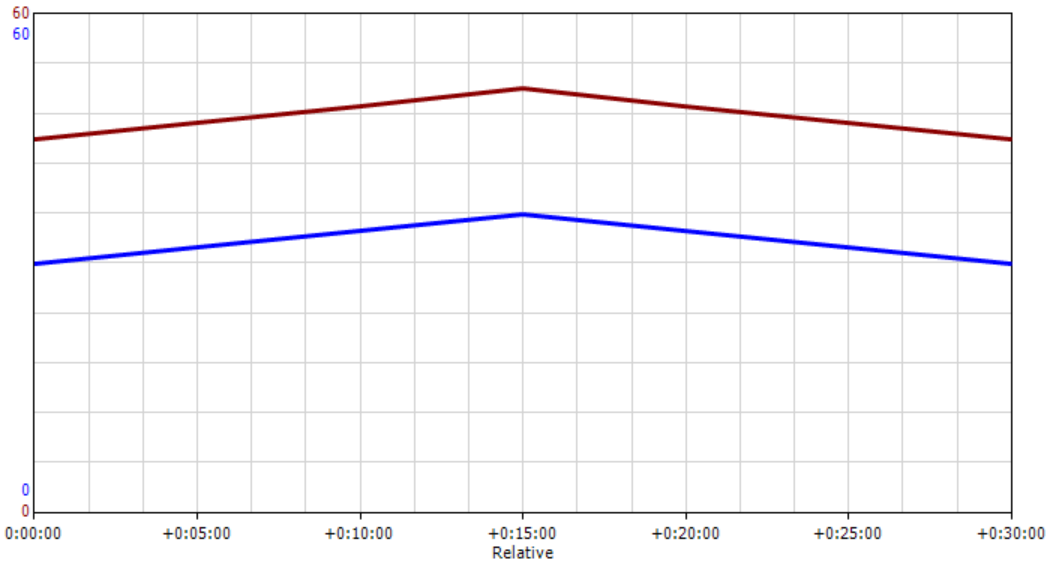
| Time | Low | High |
|---|---|---|
| 0:00:00.00 | 30 | 45 |
| +0:05:00.00 | 32 | 47 |
| +0:10:00.00 | 34 | 49 |
| +0:15:00.00 | 36 | 51 |
| +0:20:00.00 | 34 | 49 |
| +0:25:00.00 | 32 | 47 |
| +0:30:00.00 | 30 | 45 |

On a trend chart in relative time mode, these points look like the following:

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

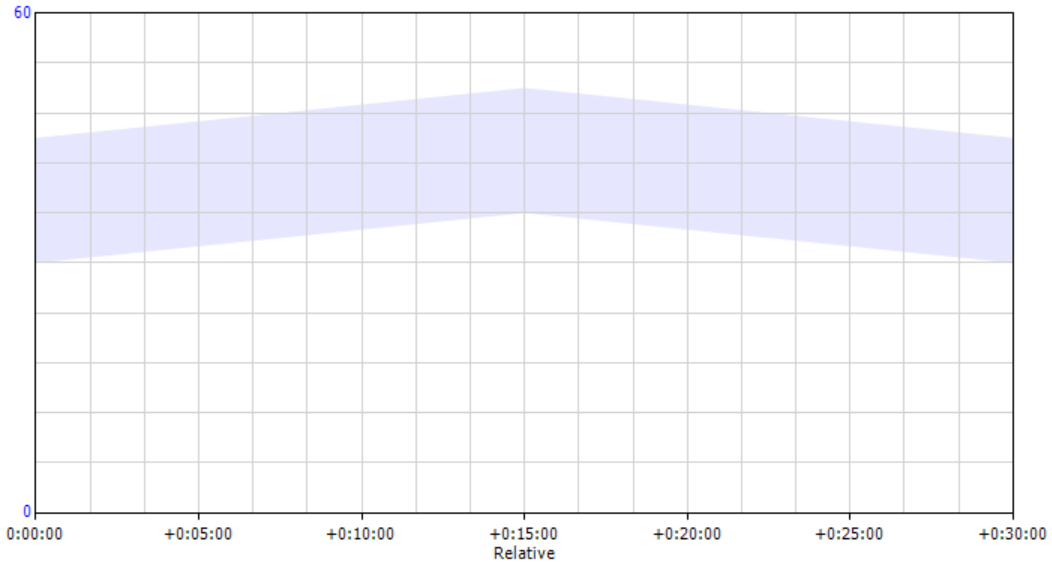



The connecting boundaries look like the following:




The area between these boundaries constitutes the target region:

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




The target region has the same color as the tag's trend curve. It is only shown when the tag is currently selected in the Tag List. Also, target regions are not visible if you are using stacked traces.

You can define and save target regions separately for each tag. Target regions are saved in the trend file. If you delete a tag from the trend, its target region is deleted as well. To use the same target region for multiple tags or in different trends, either copy and paste it or create a CSV file with the target region data that you can load for each tag. For more information, see the procedures below.

The following section explains how to set up a target region for a tag. To specify whether and how values outside the target region should be highlighted, and to set the target region's opacity, see Configuring Target Region Properties.

### To configure a target region for a trend tag

1. In the Tag List pane, do one of the following:
   - Right-click on the name of the tag and then click **Configure**.
   - Double-click on the name of the tag.

   The **<ServerName:Tagname>** dialog box appears with the **General** tab selected.
2. Click the **Target Regions** tab.
3. Edit region items by using any of the following procedures:
   - Edit region items manually
   - Load region items from a CSV file
   - Paste region items in CSV format from another application
   - Paste region items from another tag
   - Enable or disable a tag's target region
4. Click **OK**. The target region appears in the trend chart, spanning the time period that you defined using the region items' time offsets.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### To edit region items manually

- Do any of the following:
  - To add an item, click **Add**. A new item appears in the list. Double-click each cell to edit it.
  - To delete an item, right-click it and click **Cut**.
  - To delete all items, click **Clear All**.
  - To move an item up or down in the list, select it and then click the up or down arrows.

### To load region items from a CSV file

1. Click **Load file**. A standard **Open** dialog box appears.
2. Select the file you want and click **Open**. The list is populated with the entries from the CSV file.

   Note the following format requirements for the CSV file:

   - Each row must contain a region item composed of three values: the time offset, the low value, and the high value. The format of the time offset is the same as for time offsets in relative time mode. For more information, see Time Offset Formats.
   - The Trend application tries to determine the CSV delimiter and the decimal and time separators automatically. If one of the values contains a delimiter or separator character, that value must be enclosed in double quotation marks.

### To paste region items in CSV format from another application

1. In the other application, open the file that contains the region items in CSV format. Copy the CSV data to the clipboard.
2. In the Trend application, right-click the list of region items, and then click **Paste**. The list is populated with the pasted entries.

   The format of the copied data must follow the same conventions as content in CSV files. For more information, see the previous section.

### To paste region items from another tag

1. In the Tag List pane, double-click the name of the tag whose region items you want to copy. The **<ServerName:Tagname>** dialog box appears with the **General** tab selected.
2. Click the **Target Region** tab.
3. In the list of region items, select the item(s) you want to copy. To select multiple items, hold down SHIFT and/or CTRL while clicking.
4. Right-click the selected items and click **Copy**.
5. Click **OK** to close the dialog box. Repeat steps 1 and 2 for the tag where you want to paste the region items.
6. Right-click the list of region items and click **Paste**. The list is populated with the pasted entries.

### To enable or disable a tag's target region

1. In the Tag List pane, double-click the name of the tag. The **<ServerName:Tagname>** dialog box appears with the **General** tab selected.
2. Click the **Target Region** tab. Select or clear the **Show target region** check box to enable or disable the tag's target region.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

**Note:** Regardless of this setting, the target region for a tag is only shown when that tag is currently selected in the Tag List.

3. Click **OK**.

### Configuring Retrieval Options for a Tag

You can configure retrieval options separately for each tag in a trend. Tags can either use the retrieval style specified in the trend options, a different predefined retrieval style, or custom retrieval settings.

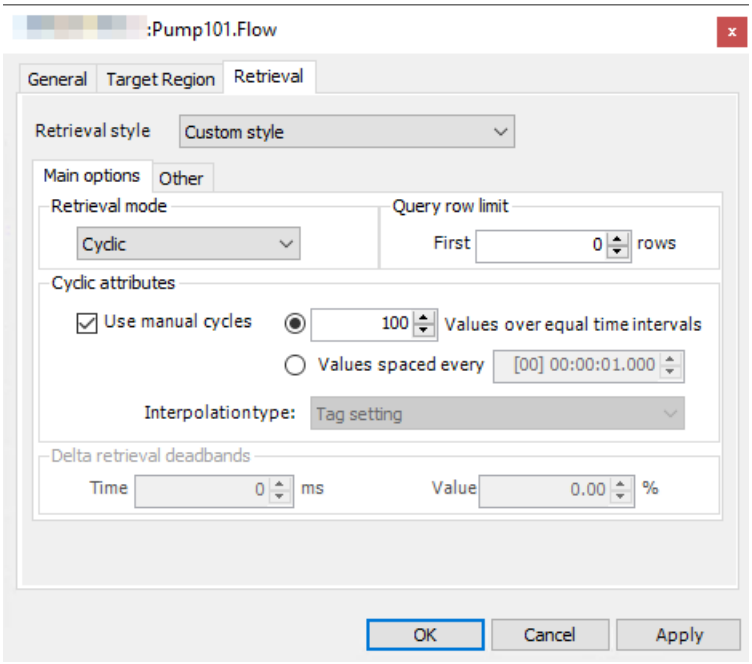
Most of the retrieval settings that you configure here only apply if you are retrieving data from a Historian with a version of 9.0 or later.

If you are using an earlier Historian version, see Configuring Other Options and Working with Retrieval Styles for details.

#### To configure retrieval options for a tag

1. In the Tag List pane, do one of the following:
   - Right-click on the name of the tag and then click **Configure**.
   - Double-click on the name of the tag.

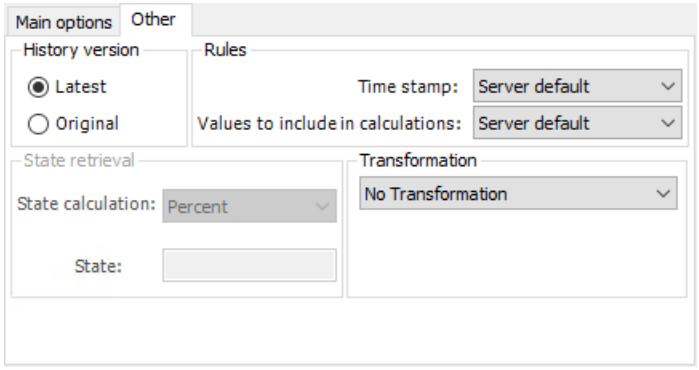
   The **<ServerName:Tagname>** dialog box appears with the **General** tab selected.
2. Click the **Retrieval** tab.
3. Do one of the following:
   - To have the tag use the same retrieval settings as specified in the trend options, click **Style selected at option level** in the **Retrieval style** list. This is the default setting when you add a tag to a trend.
   - To use a predefined retrieval style, click its name in the **Retrieval style** list. For more information on retrieval styles, see Working with Retrieval Styles.
   - To use custom retrieval settings, click **Custom style** in the **Retrieval style** list.




© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

4. Specify any additional settings required.
   - If you are using custom retrieval settings, select a retrieval mode and specify all the settings that are relevant to it.
   - If you are using one of the predefined styles, you can edit all settings that are not covered by the style definition. For information on which settings are covered by style definitions, see Working with Retrieval Styles. Because a style definition can contain multiple sets of retrieval settings with different retrieval modes, some of the settings available for editing here may turn out to be irrelevant for the retrieval mode that actually gets used for a given query. However, because there is no way to know in advance which retrieval mode will be used, the settings are still available for editing.

     For more information on the various retrieval options, see Understanding Retrieval Options.
5. Specify any additional settings required on the **Other** tab.




   a. In the **History version** area, click **Latest** or **Original** to overwrite the values of a stored tag. For more information on History version, see History Version (wwVersion).
   b. In the **Rules** area, do the following:
      - In the **Timestamp** list, click the required timestamp value. For more information on the Time stamp rule, see Timestamp Rule (wwTimestampRule).
      - In the **Values to include in calculations** list, click the data values that you want to include in the result. You can include the following quality rules:

        **Good and uncertain quality**: To include data values with uncertain quality in calculations.

        **Good quality**: To exclude data values with uncertain quality from calculations.

        **Optimistic quality**: To use the optimistic quality when the data values are missing. This option can be configured at either the tag level or the application level.

        **Server default**: To use the default quality rule specified at the Historian level.

        For more information on each option, see Quality Rule (wwQualityRule).
   c. In the **State retrieval** area, do the following:
      - In the **State calculation** list, click the state calculation.
      - In the **State** box, specify the value of the state. For example, you can specify either a open or close state for the SteamValve tag.

        **Note:** The state calculation settings are applicable only to ValueState and RoundTrip retrieval modes.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

For more information on State calculation, see State Calculation (wwStateCalc).

d. In the **Transformation** list, click the transformations to be applied to the result. You can include the following transformations:

- **No Transformation**: If the query does not specify the filter element or if the value is not overridden for the filter element.
- **Remove outliers**: To remove outliers from a set of analog points.
- **Convert analog values to discrete**: To convert value streams for any analog tag to discrete value streams.
- **Snap to base value**: To force values in a well-defined range around one or more base values to "snap to" that base value. For more information on Transformation, see Analog Value Filtering (wwFilter).

## Scrolling through Tags in a Trend

You can change which tag is currently selected by using toolbar buttons. When using single tag mode, this allows you to "scroll" through tags without having the Tag List visible.

### To change the currently selected tag

- From the **Chart** menu, in the **Tag** group, click either **Next** or **Previous** to scroll to the tag that you want.

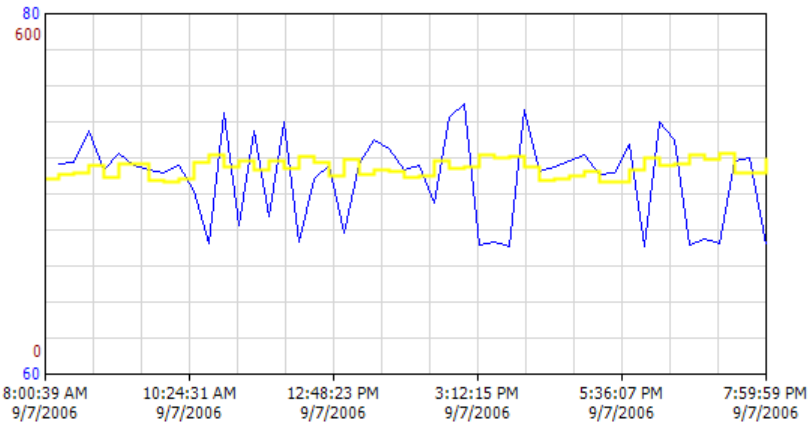
## Highlighting a Tag

You can select and highlight a tag in the chart. To remove the highlighting, follow the same procedure so that no check mark or highlighting appears.

### To highlight a tag

1. Select the tag that you want in the Tag List.
2. From the **Chart** menu, in the **Tag** group, select **Highlight**.

   The tag is highlighted in the chart.




## Showing a Single Tag in the Trend

When you initially create a Tag List for a trend, all the tags are included in the display. Setting the trend to single tag mode allows you to exclude all tags but one from being displayed in the trend chart, without removing them from the Tag List.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### To display a single tag in the trend

1. From the **Chart** menu, in the **Layout** group, select **Single** so that it is highlighted.

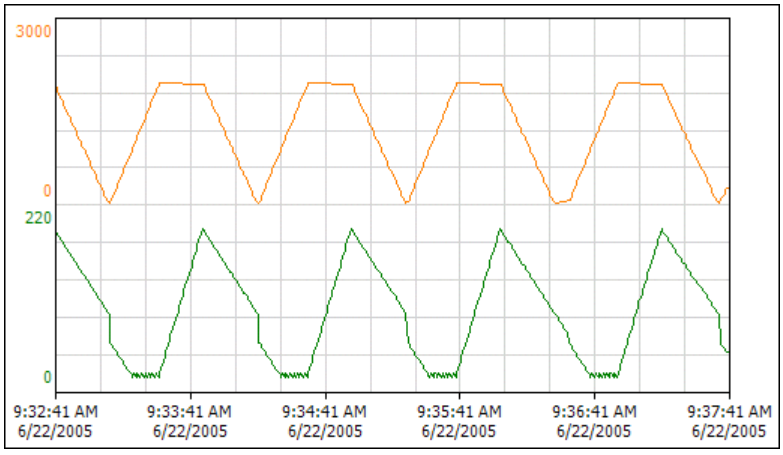
   To again view multiple tags in the chart, deselect **Single** so that it is not highlighted.

## Stacking Traces

You can view individual trends, or "traces," for multiple tags in the chart by stacking them in the display.

### To stack tags in the trend

1. From the **Chart** menu, in the Layout group, select **Stacked**.




## Showing Live Data

A trend can be configured to show live data. Live data is data that is retrieved continuously in real time for a fixed duration that is relative to the current time (for example, the last hour).

When retrieving live data, the Trend application retrieves data incrementally with every update. For example, if you set the update rate to ten seconds, then every ten seconds, the Trend application retrieves data for the last ten seconds and updates the chart with that data. Additionally, it periodically retrieves data for the entire chart time span to refresh the entire chart. You can specify both the update rate and the refresh interval for the entire chart. For more information, see Configuring General Properties.

If the connection to the Historian is lost while retrieving live data, any data that was retrieved up to that point is still shown on the chart until the next full refresh occurs. If the Historian is still unavailable at that time, the old data is cleared from the trend chart.

---

**Notes:** When retrieving live data, the time stamp rule for data retrieval is forced to "End." For more information on this setting, see Timestamp Rule (wwTimestampRule).

While the chart is displaying live data, if the trended data includes points outside of the visible plot area, any affected tags are automatically scaled to fit.

---

### To display "live" data

1. Click the **Update to Current Time** toolbar button so that it is highlighted.
2. In the Duration list of the Time toolbar, click a duration or type one manually.
3. Click the **Live Mode** toolbar button.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### To display "static" data

- Click the **Stop Live Mode** toolbar button.

## Showing Historical Data in "Replay" Mode

When you "replay" historical data, the data is continuously plotted on the chart, starting with the start date. By default, the "replay" mode uses real-time speed. For example, if you set the chart to update every second, the start time advances one second with each update.

You can accelerate or slow down the playback by specifying a "playback speed." For example, if you select a playback speed of 2 x (that is, twice the normal speed) and set the chart to update every second, the start time advances two seconds with each update, as compared to one second for a playback speed of 1 x (normal speed) or half a second for a playback speed of 1/2 x (half the normal speed).

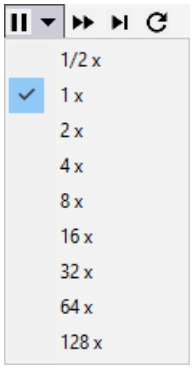
### To "replay" historical data

1. Configure a query with a time period whose end time is earlier than the current time.
2. Make sure the **Update to Current Time** toolbar button is *not* highlighted. If it is highlighted, click it so that it isn't highlighted anymore.
3. Click the **Live Mode** toolbar button.

   The trend curve is dynamically drawn on the chart. The **Replay Mode** icon appears at the top center of the chart to indicate replay mode.

### To "replay" historical data at a slower or faster speed

1. Configure a query with a time period whose end time is earlier than the current time.
2. Make sure the **Update to Current Time** toolbar button is *not* highlighted. If it is highlighted, click it so that it isn't highlighted anymore.
3. Click the downward arrow next to the Live Mode toolbar button. A list of playback speeds appears.




4. Click the playback speed you want to use.
5. Click the **Live Mode** toolbar button.

   The trend curve is dynamically drawn on the chart at the specified speed. The **Replay Mode** icon and the playback speed appear at the top center of the chart to indicate replay mode. To change the speed while replay mode is active, repeat steps 1 and 2.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

**Note:** When you replay historical data at an accelerated speed, eventually the time period "catches up" with the current time. When that happens, the speed is automatically reset to normal, and the trend effectively goes into live mode. For more information, see Showing Live Data.

## Configuring Predictive Data Retrieval

You can define a predictive data retrieval option in the Historian Client. Predictive retrieval means the Historian Client will interpolate future data trend based on the existing data received.

For example, suppose you were using the Historian Client to view a trend for a tank level at your plant. With the data already stored, you can see the tank level values since operations started this morning, but now you would like to know what the value is likely to be in an hour.

**Note:** Predictive retrieval is supported for the best-fit, full, and delta retrieval modes. If this option is applied to other retrieval modes, it is ignored.

By using the Pan Right (">>") toolbar button, you can advance the trend and, with the Historian Client's new predictive data retrieval feature, you can see a prediction for that future value based on current data. Historian Client interpolates the trend based on the last value was received.

**Note:** When you save the trend to a CSV file, you can also see predictive data in an Excel Workbook. See Saving Trend Data to a .CSV File for more information.

### Using the Transformation Option at application level

1. From the **Tools** menu, click **Options**.
2. In the **Options** dialog box, click the **Other** tab.
3. From the **Transformation** dropdown, choose **Extrapolate using linear regression**.

### Using the Transformation Option at tag level

1. From the **Trend Tag List** grid, double-click a tag.

   The **Tag Properties** for that tag display.
2. From the **Retrieval** tab, click the **Other** tab.
3. From the **Transformation** dropdown, choose **Extrapolate using linear regression**.

## Scaling Tags

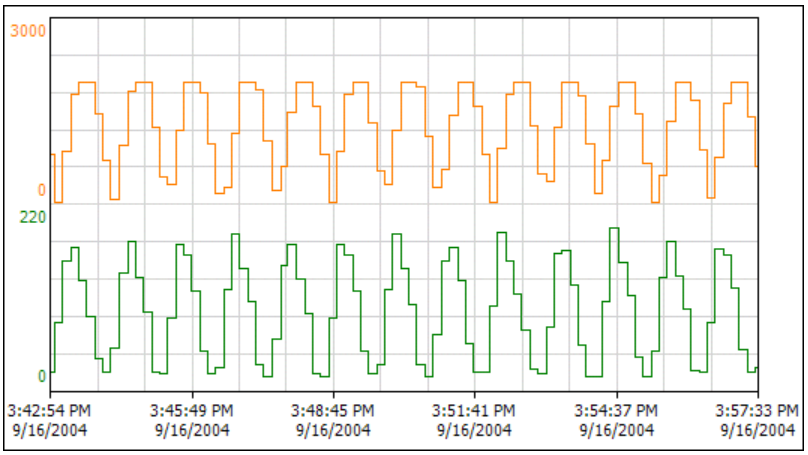
The scale is the minimum and maximum range of values for the tag. Each tag has its own scale, which is usually quite different from other tags in the chart. Scales for tags on the chart are always displayed along the value axis.

Only discrete, analog, and summary tags can be scaled; event and string tags cannot be scaled. For discrete tags, the message associated with the 1 value is used as the maximum scale value, and the message associated with the 0 value is used as the minimum scale value.

In the following chart, two tags are trended in stacked mode. The scale for the ReactLevel tag is from 0 to 3000. The scale for the other tag, ReactTemp, is from 0 to 220.

The minimum and maximum values of each scale appear on the value axis.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




The initial scale of a tag is determined by its Min/Max EU settings in the Historian. To adjust tag scales, you have two options:

- Edit the value axis range individually for each tag. For more information, see Configuring Trend Options for a Tag.
- Use the scaling commands to adjust the scale of single tag or all tags. For more information, see Scaling Tags Up or Down and subsequent sections.

You can also change the way in which scale values appear on the value axis. The following sections describe the available options.

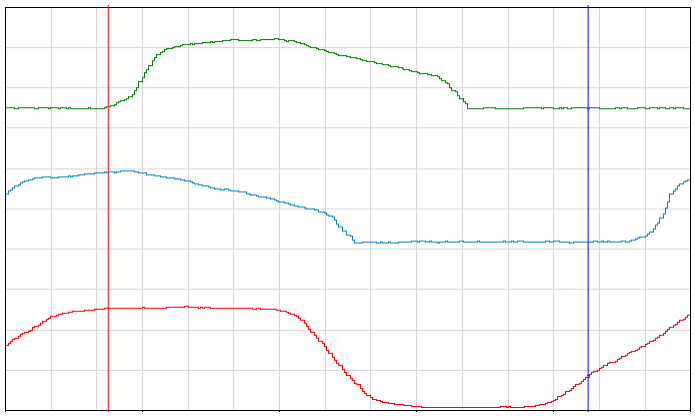
### Showing No Scales on the Value Axis

You can configure the chart to show no chart label, X and Y axes scales and cursor information. This makes the entire chart area margins smaller and you get more area to plot and view the trend chart.

#### To show no scales on the value axis

- From the **View** menu, in the **Scale** group, select **None**.

  The following chart is configured to show no chart label, X and Y axes scales and cursor information. Stacked mode is applied.



### Showing Single Scale on the Value Axis

You can configure the chart to show single value scale along the value axis.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

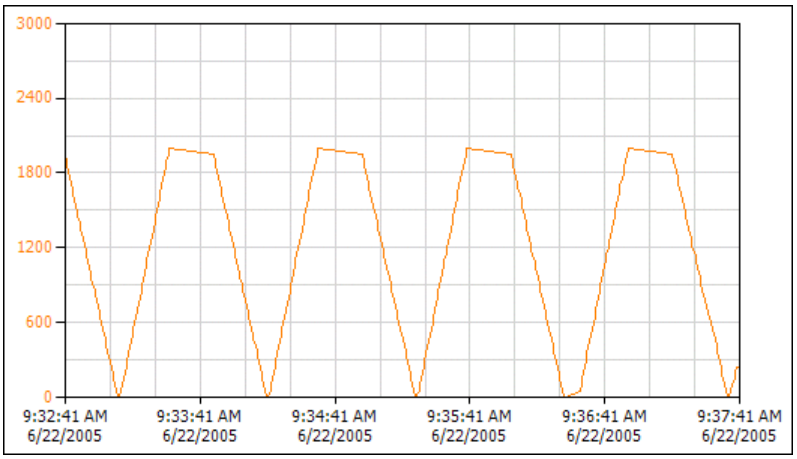
If the chart includes multiple tags, the scale of the currently selected tag in the chart is shown along the value axis. The scale label color matches the pen color of the selected tag. As you scroll through tags in the chart, the value axis always shows the scale of the selected tag. The labels along the value axis are shown even if the current tag is hidden.

### To show single scale

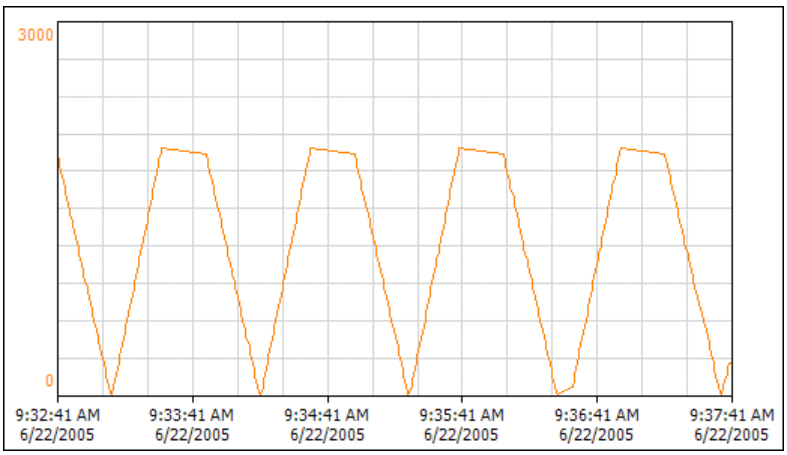
- From the **View** menu, in the **Scale** group, select **Single**.

How a chart looks when single scale is applied depends on the number of tags in the chart and whether the chart is in stacked mode.

The following chart includes single tag and is configured for single scale. Stacked mode is not applied.

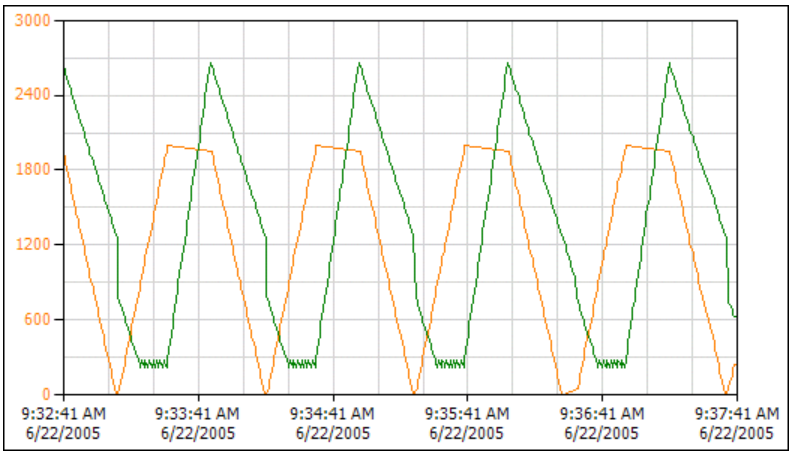



The following chart includes single tag and is configured for single scale. Stacked mode is applied. Only the minimum and maximum values are shown.

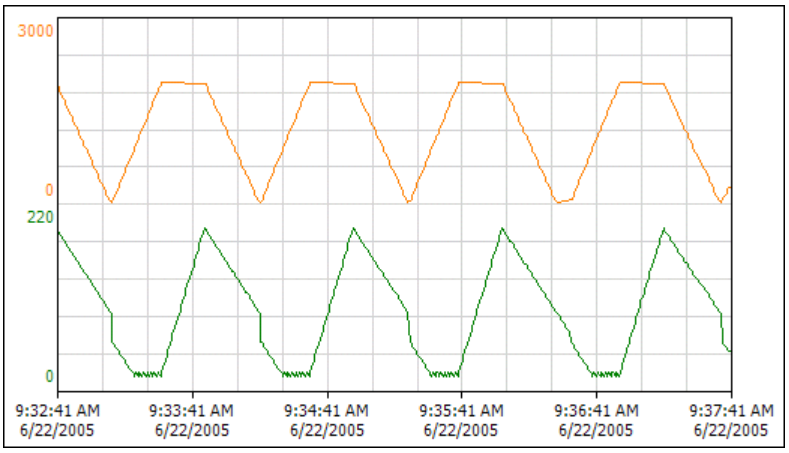



The following chart includes multiple tags and is configured for single scale. Stacked mode is not applied.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




The following chart includes multiple tags and is configured for single scale. Stacked mode is applied. The minimum and maximum values for each tag are shown for the corresponding trend curve.




### Showing Multiple Scales on the Value Axis

You can configure the chart to show multiple value scales. For multiple scales, only the minimum and maximum values are shown on the value axis. The scale label colors match the pen colors of the corresponding tags. The values of hidden tags are not shown.

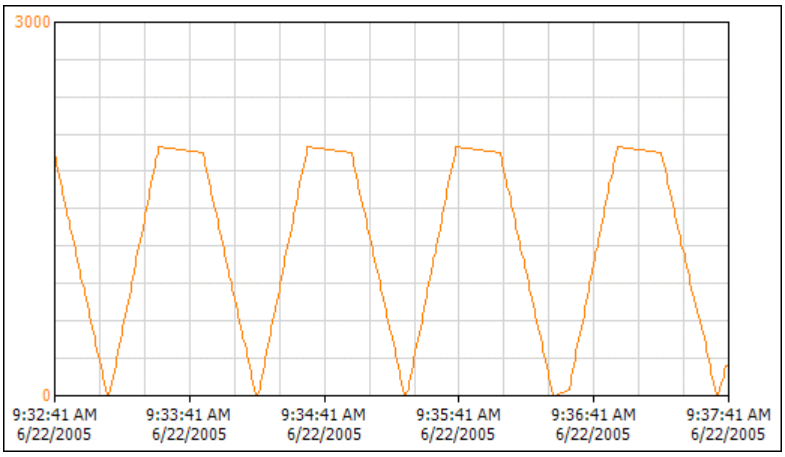
#### To show multiple scales

- From the **View** menu, in the **Scale** group, select **Multiple**.

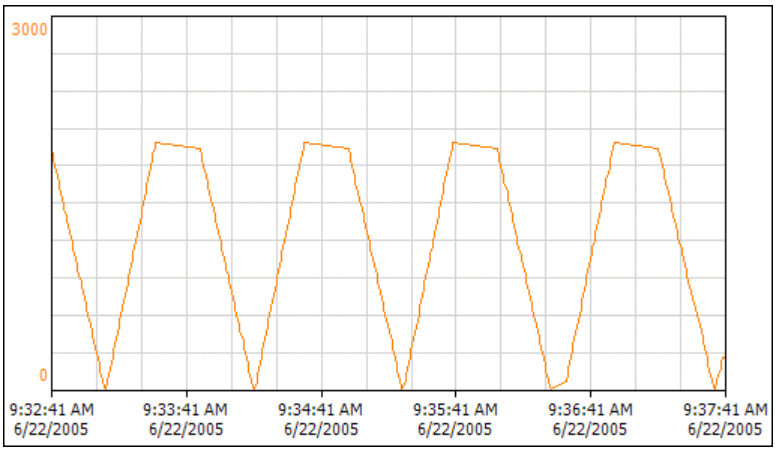
How a chart looks when multiple scales are applied depends on the number of tags in the chart and whether the chart is in stacked mode. When stacked mode is applied, there is no difference between using single scale or multiple scales.

The following chart includes single tag and is configured to use multiple scales. Stacked mode is not applied.

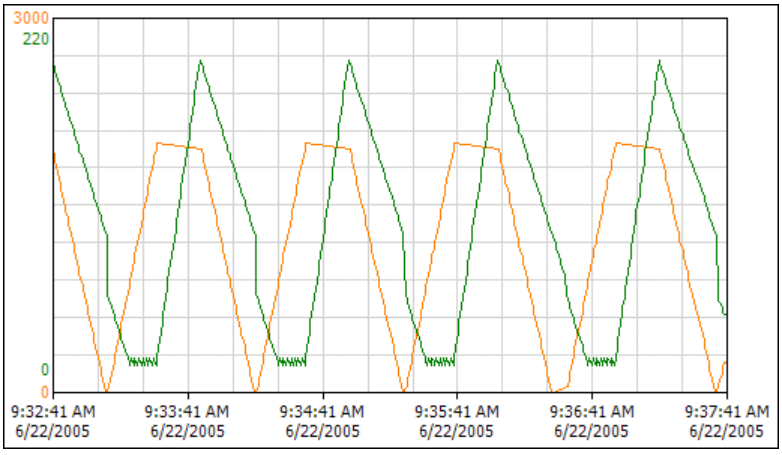
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




The following chart includes single tag and is configured to use multiple scales. Stacked mode is applied.

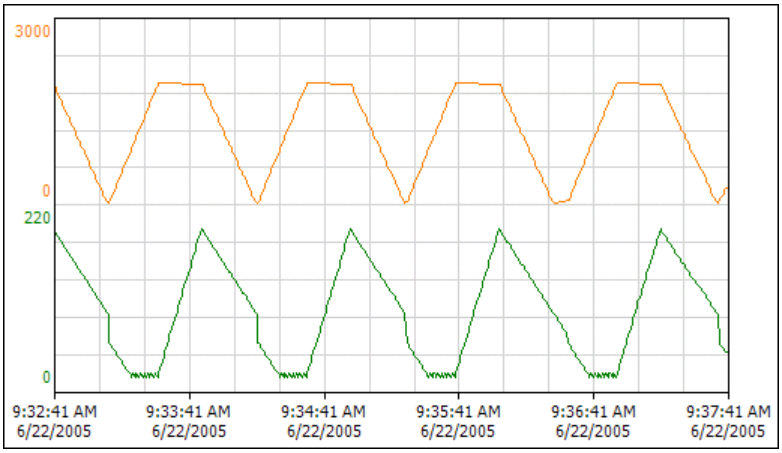



The following chart includes multiple tags and is configured to use multiple scales. Stacked mode is not applied. The top and bottom labels show the scale for the first tag in the Tag List that is included in the chart. For the second tag in the Tag List, the scale labels are shown as second from the top and second from the bottom. As you add tags to the chart, the addition of scale labels continues to progress inward toward the middle of the chart. If there is not enough space on the chart to show all of the scale labels, then the innermost values are not shown.




The following chart includes multiple tags and is configured to use multiple scales. Stacked mode is applied.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.



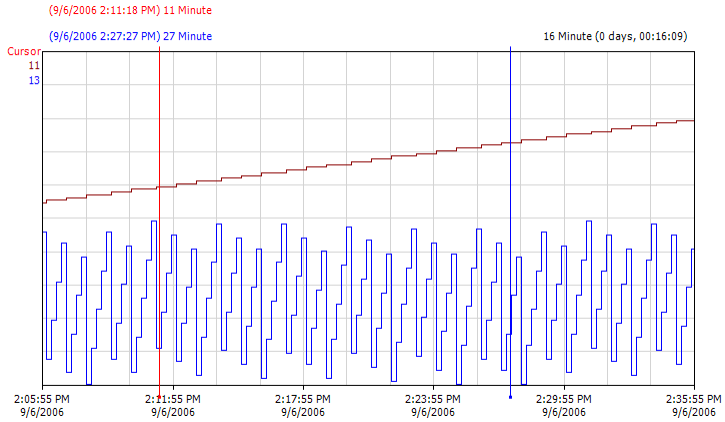

### Showing Cursor Values on the Value Axis

You can configure the chart so that the value axis shows the value of each tag at the position of the first X axis cursor. The axis label colors match the pen colors of the corresponding tags. The values of hidden tags are not shown.

#### To show cursor values on the value axis

- From the **View** menu, in the **Data** group, select **Cursor Values**.

  The following chart is configured to show cursor values on the value axis. Stacked mode is applied.




### Scaling Tags Up or Down

You can scale a single tag or all of the tags in a trend up or down. If you scale a tag down, the range of values increases by one third. For example, if the scale is 10 to 70, it becomes 0 to 80. If you scale a tag up, the range of values decreases by one fourth. For example, if the scale is 0 to 80, it becomes 10 to 70.

#### To scale up a single tag

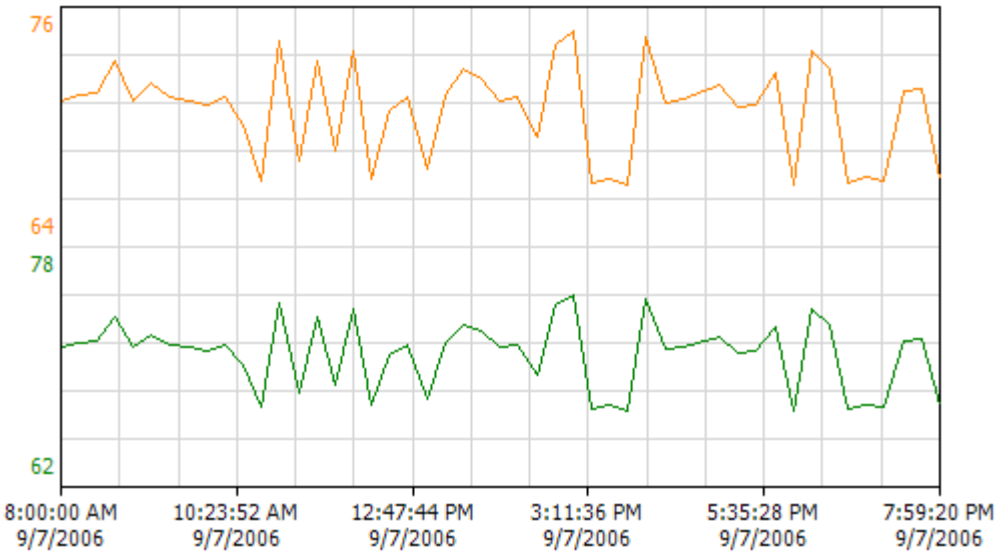
1. Select a tag from the tag list.
2. From the **Chart** menu, in the **Single Tag Scale** group, click **Scale Up**.

#### To scale all tags up

- From the **Chart** menu, in the **All Tags Scale** group, click **Scale Up**.

The following example shows a single tag scaled up:

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.



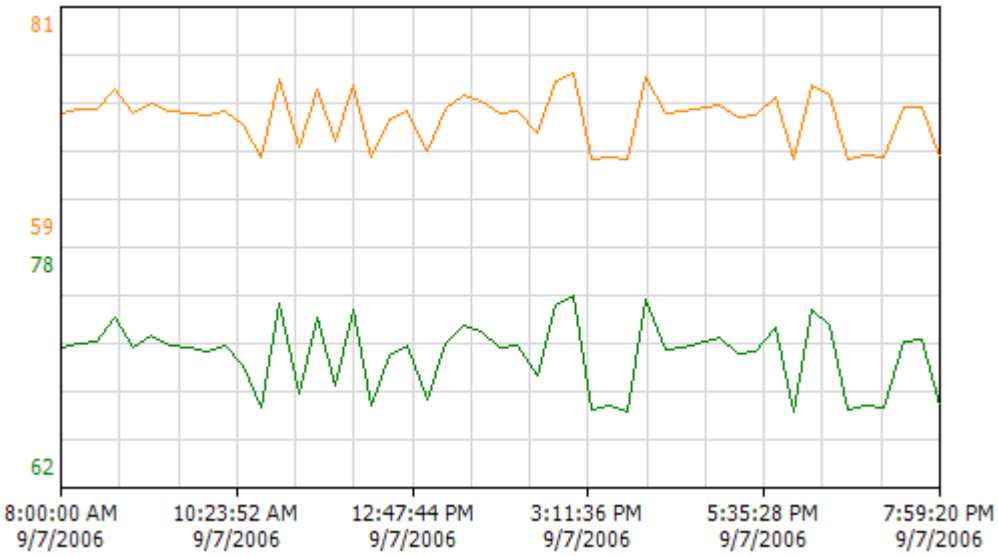

### To scale down a single tag

1. Select a tag from the tag list.
2. From the **Chart** menu, in the **Single Tag Scale** group, click **Scale Down**.

### To scale all tags down

- From the **Chart** menu, in the **All Tags Scale** group, click **Scale Down**.

The following example shows a single tag scaled down:




### Automatically Scaling Tags

When a tag is automatically scaled, the value axis range is automatically adjusted to reflect the actual data currently being displayed for the trend. For example, if the default value axis range is 0 to 3000, and the data ranged from 1827 to 2059, the scale might be automatically adjusted to a range of 1800 to 2100.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

The adjusted scale does not exactly match the actual minimum and maximum data values for the chart. The calculation rounds the values so as to make the chart easier to read. Also, a percentage allocation is added to the final values so that the adjusted scale fits within the boundaries of the trend chart. Therefore, the adjusted scale is a round number slightly above the actual data values.

You can automatically scale a single tag or all of the tags in a trend. For information on resetting scales back to the original default, see Returning Tags to Their Original Scale.

Tag scaling is performed automatically for a trend while it is retrieving live data. If the trended data includes points outside of the scale region, any affected tags are scaled automatically.

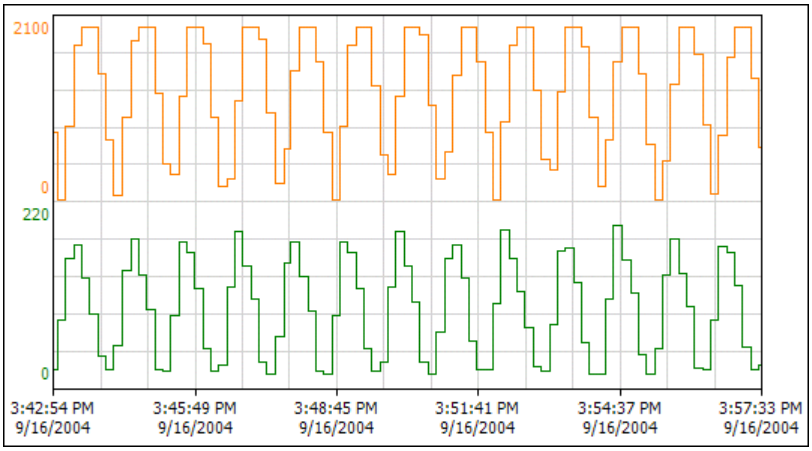
### To automatically scale a single tag

1. Select a tag from the tag list.
2. From the **Chart** menu, in the Single Tag Scale group, click **Auto**.

### To automatically scale all tags

- From the **Chart** menu, in the All Tags Scale group, click **Auto**.

The following example shows a tag automatically scaled:




## Returning Tags to Their Original Scale

You can return the value axis scale for a single tag or all of the tags in a trend to the original scale.

### To return a single tag to original scale

1. Select a tag from the tag list.
2. From the **Chart** menu, in the **Single Tag Scale** group, click **Original**.

### To return all tags to original scale

- From the **Chart** menu, in the **All Tags Scale** group, click **Original**.

## Moving Tags Up or Down in the Chart

You can move a single tag or all of the tags in a trend up or down in the trend chart. The scale is adjusted to reflect the move.

### To move a single tag up

1. Select a tag from the tag list.

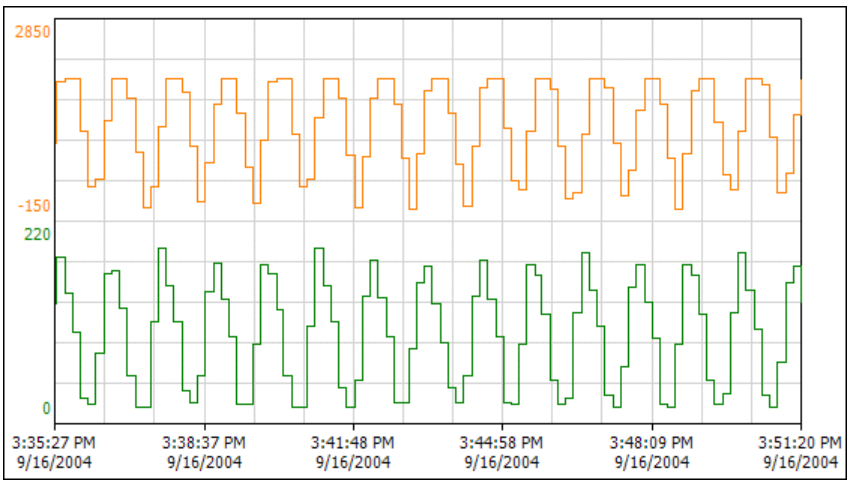
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

2. From the **Chart** menu, in the Single Tag Scale group, click **Move Up**.

### To move all tags up

- From the **Chart** menu, in the **All Tags Scale** group, click **Move Up**.

The following example shows a single tag moved up in the trend chart:




## Using "Rubber Band" Scaling

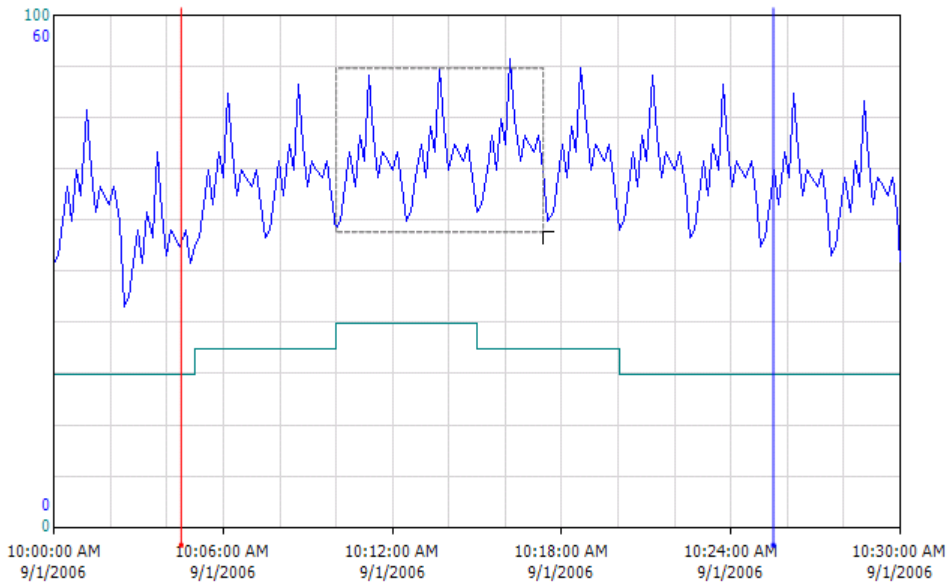
Rubber band scaling allows you to "lasso" an area of the trend chart with the mouse cursor to automatically adjust the time and value axis scales based on the area that you lassoed. If you are using stacked traces, rubber band scaling is limited to the time axis.

### To use rubber band scaling

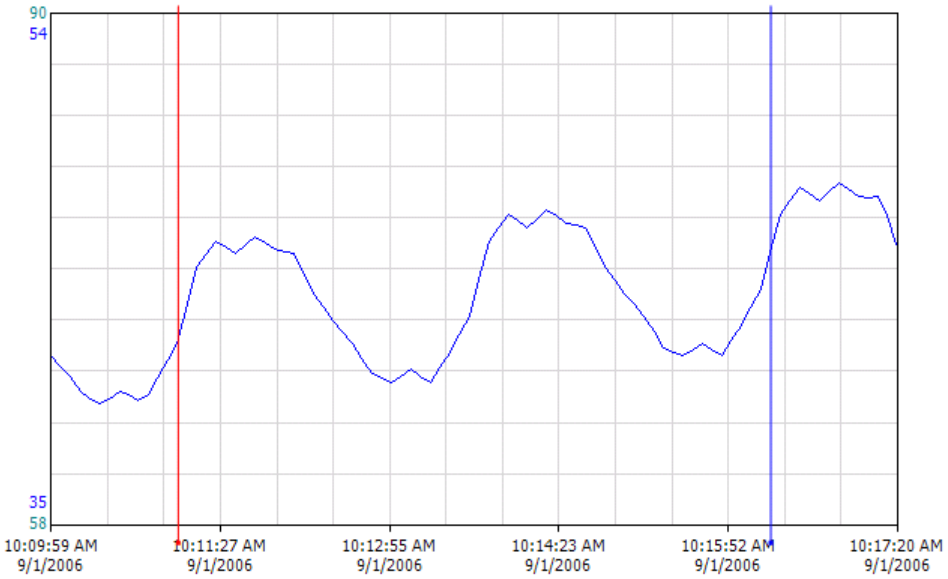
1. From the **Chart** menu, in the **Zoom** group, click **Selection** so that it is highlighted.
2. Unless you are using stacked traces, rubber band scaling affects both the time and the value axes. Time axis scaling always applies to all tags in the chart. Value axis scaling can apply to all tags or the currently selected tag only. If you want value axis scaling to apply to all tags, from the **Chart** menu, in the **Zoom** group, click **Select All** so that it is highlighted.

   If you are using stacked traces, rubber band scaling affects the time axis only, and this setting has no effect.
3. Drag a box around the area you want to use for the new scale.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




The trend chart is automatically redrawn using the new zooming values that you selected with the mouse.




## Panning in the Trend Chart

By default, the chart is panned to the left or right by the time span percentage set for the chart. This time span applies to both left and right panning and is a percentage of existing data coverage on the chart. The default time span is 75 percent; that is, when you pan right or left, the chart pans by three quarters of the total time span. For example, if the time axis for the chart spans one hour, the chart is panned to the left or right by 45 minutes.

For more information on configuring the panning scale, see Configuring Axis Properties.

### To pan left

- Click the **Pan Left** toolbar button.

### To pan right

- Click the **Pan Right** toolbar button.

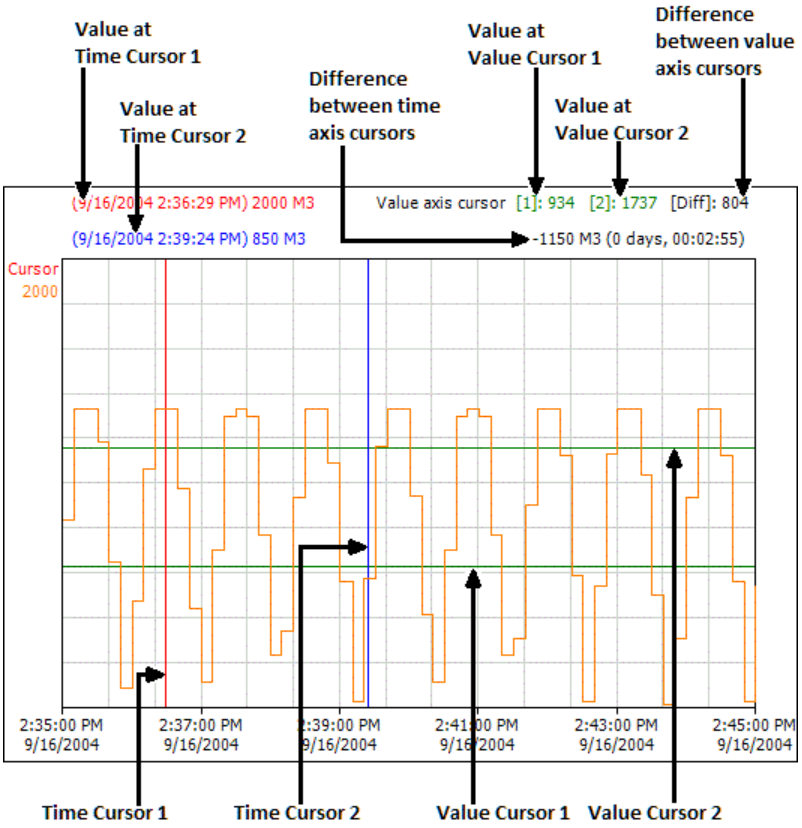
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

If the time scale is set into the future, then white space appears.

During a pan, the time picker changes to reflect the currently displayed selection.

### Using Axis Cursors

Each trend chart has two value cursors and two time cursors. These cursors pinpoint tag values in the chart. The values shown for the axis cursors are updated continuously as the cursors are moved or as the trend curve moves in live mode.




You can show or hide the value and time cursors, as well as the values at the cursors. You can also show or hide the value cursor difference.

To configure the line and font colors for the cursors and cursor value displays, see Configuring Axis Properties.

### Moving a Cursor

#### To move a cursor

1. Select the cursor with your mouse.
2. Drag the cursor to the spot on the chart.

As you move the cursor in the trend chart, the value for the tag where the cursor and the tag curve meet appears.

### Showing/Hiding the Axis Cursors

#### To show the time axis cursors

- From the **View** menu, in the **Data** group, select **Time Axis**.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### To show the value axis cursors

- From the **View** menu, in the **Data** group, select **Value Axis**.

To hide the cursors, follow the same procedure so that no highlighting appears.

## Showing/Hiding the Cursor Difference

### To show the cursor difference

- From the **View** menu, in the **Data** group, select **Cursor Difference**.

To hide the cursor difference, follow the same procedure so that no highlighting appears.

## Zooming

When you use zooming in the trend chart, the zoom value depends on whether you are using time axis cursors.

If you are not using time axis cursors, zooming is based on the total value for the time axis. The trend chart is zoomed in or out based on the current percentage set for the zooming scale. All zooms are positioned along the middle line of the trend chart.

If you are using time axis cursors, zooming in sets the time period to the period between the cursors. Zooming out works as described above.

For information on setting the zooming percentage, see Configuring Axis Properties.

### To zoom in

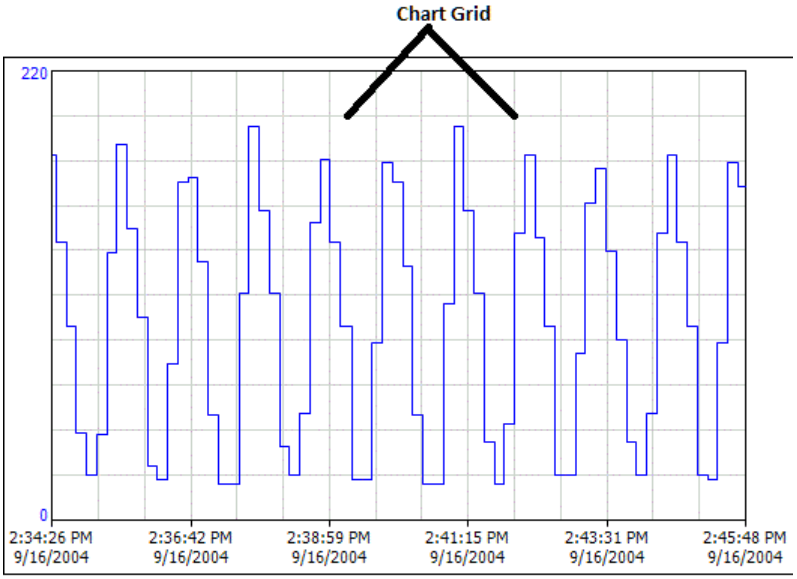
- From the **Chart** menu, in the **Zoom** group, click **In**.

### To zoom out

- From the **Chart** menu, in the **Zoom** group, click **Out**.

## Showing/Hiding the Chart Grid

You can show/hide the horizontal and vertical chart lines.




© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### To show the horizontal lines

- From the **View** menu, in the **Grid** group, select **Horizontal**.

### To show the vertical lines

- From the **View** menu, in the **Grid** group, select **Vertical**.

To hide the lines, deselect both **Horizontal** and **Vertical**.

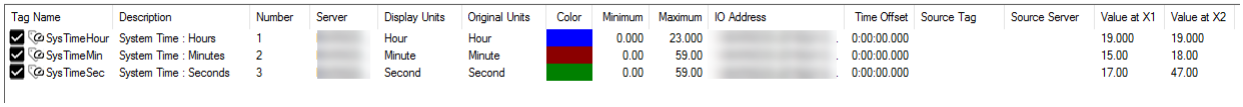
## Viewing Tag Definition Information

Use the Tag List to view information for the tags that you have added to the trend chart.

By default, the Minimum Raw, Maximum Raw, Precision, Format, and Date Created columns are not visible in the Trend application's Tag List. To show the columns, drag the right column separator of the Time Offset column heading to the right. Repeat this step until all columns are visible.

### To view tag information

- In the Tag List pane, scroll to the name of the tag for which you want to view definition information.



| Tag Name | Description | Number | Server | Display Units | Original Units | Color | Minimum | Maximum | IO Address | Time Offset | Source Tag | Source Server | Value at X1 | Value at X2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SysTimeHour | System Time : Hours | 1 | [redacted] | Hour | Hour | | 0.000 | 23.000 | [redacted] | 0:00:00.000 | | | 19.000 | 19.000 |
| SysTimeMin | System Time : Minutes | 2 | [redacted] | Minute | Minute | | 0.00 | 59.00 | [redacted] | 0:00:00.000 | | | 15.00 | 18.00 |
| SysTimeSec | System Time : Seconds | 3 | [redacted] | Second | Second | | 0.00 | 59.00 | [redacted] | 0:00:00.000 | | | 17.00 | 47.00 |

The grid shows the following information:

| Name | Description |
|---|---|
| Tag Name | The name of the tag within the Historian. If the data values are coming from the application server, the attribute reference is shown as the tag name. For application server attributes, you can also choose to show the hierarchical name along with the attribute reference. |
| Description | The description for the tag. |
| Number | The serial number of the tag. |
| Server | The name of the server that contains the tag. |
| Display Units | The displayed unit of measure of the tag value. Examples: seconds, psi, and lbs. By default, this is the same as the "Original Units", but when licensed and configured, you can select different display units. |
| Original Units | The configured unit of measure of the tag value. Examples: seconds, psi, and lbs. |
| Color | The line color of the tag. |
| Minimum | The minimum value of the raw acquired value. |
| Maximum | The maximum value of the raw acquired value. |
| IO Address | The complete I/O address for the tag, including I/O Server name, application, topic, and item name. |
| Time Offset | The amount of time that the trend curve of the currently selected tag will be shifted from the actual time. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| Source Tag | The name of the source tag that provides the source data for the replicated tag. |
| Source Server | The name of the server that contains the source tag. |
| Value at X1 | The value that is displayed at Timer axis Cursor 1. |
| Value at X2 | The value that is displayed at Timer axis Cursor 2. |

- Select or clear the check box to show or hide the tag in the trend chart. This allows you to hide a tag without removing it from the list of tags.

### Viewing the Hierarchical Name in a Trend

A hierarchical name represents the fully qualified name of a contained object within Application Server. For more information, see Integration with Wonderware Application Server.

**To view hierarchical names in a trend**

- Do one of the following:
  - On the **View** menu, from the **Canvas** group select **Hierarchical Name.**
  - Right-click in the Tag Picker and click **Use hierarchical name**.

  The Trend application shows the hierarchical name instead of the tag name. For example, the Tag List, **Data Log** dialog box, and the Trend chart area show hierarchical names.

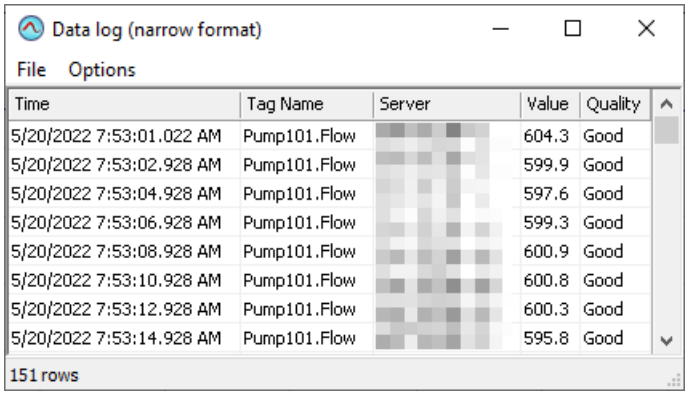
## Viewing Trend Data in a Table Format

You can view a table of all data points used in a chart. This data log can be either in a "narrow" or "wide" format. In both cases, the log only shows values for tags that aren't hidden.

### Viewing the Data Log in a "Narrow" Format

**To view the data log**

1. On the **View** menu, click **Logs**, and then select **Narrow**. The **Data log** dialog box appears.




   Data appears for the following columns:

   - Time — The time stamp for the returned value. For delta retrieval, this is the time at which the value was acquired by the Historian. For cyclic retrieval, this is the specific time requested or calculated (using a SQL function).

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

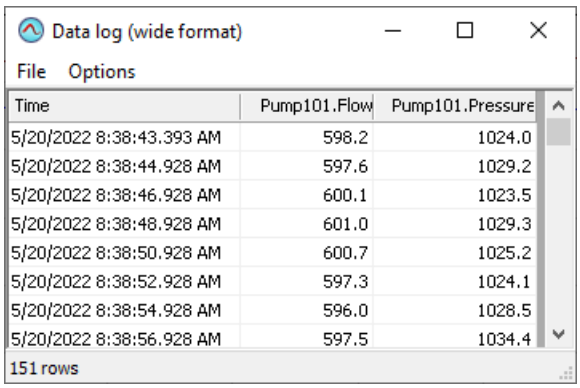
- Tag Name — The name of the tag within the Historian server. The attribute reference is displayed as a tag name for data values from application server. For application server attributes, you can also choose to show the hierarchical name along with the attribute reference.
- Server — The server from which data is being retrieved.
- Value — The value of the tag at the time stamp.
- Quality — The basic data quality indicator associated with the data value.

2. To include only the data that is between the time axis cursors on the chart, on the **Options** menu, click **Data From Between Cursors**.
3. To include all of the data on the chart, on the **Options** menu, click **Data From Between Graph Start/End**.
4. To show actual values for discrete tags (for example, 1 or 0), on the **Options** menu, click **Show Actual Values For Discretes**. When retrieving data for discrete tags in ValueState mode, you must select this option to see correct time-in-state information.
5. To show messages for discrete tags (for example, ON or OFF), on the **Options** menu, click **Show Messages For Discretes**.
6. You can copy and paste data to the Windows clipboard by right-clicking in the data and selecting the appropriate option from the menu that appears.
7. To save the data as a .csv file, on the **File** menu, click **Save As**.
8. To set up a printout of the data, on the **File** menu, click **Page Setup**. Setting up the page works like in any other Windows application.
9. To preview a printout of the data, on the **File** menu, click **Print Preview**. Using the preview window works like in any other Windows application.
10. To print the data, on the **File** menu, click **Print**. Specifying printing options works like in any other Windows application.
11. To exit the dialog box, on the **File** menu, click **Exit**. Or, click the **Close** button.

## Viewing the Data Log in a "Wide" Format

### To view the data log

1. On the **View** menu, click **Logs**, and then select **Wide**. The **Data log** dialog box appears.




© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

Data appears for the following columns:

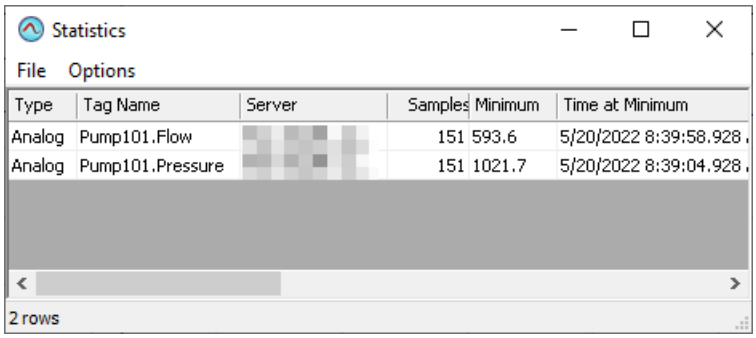
- Time — The time stamp for the returned value. For delta retrieval, this is the time at which the value was acquired by the Historian. For cyclic retrieval, this is the specific time requested or calculated (using a SQL function).
- <Tag Name> — The name of the tag within the Historian server. If the data values are coming from Application Server, the attribute reference is shown as the tag name. For Application Server attributes, you can also choose to show the hierarchical name along with the attribute reference.

2. To include only the data that is between the time axis cursors on the chart, on the **Options** menu, click **Data From Between Cursors**.
3. To include all of the data on the chart, on the **Options** menu, click **Data From Between Graph Start/End**.
4. To show actual values for discrete tags (for example, 1 or 0), on the **Options** menu, click **Show Actual Values For Discretes**. When retrieving data for discrete tags in ValueState mode, you must select this option to see correct time-in-state information.
5. To show messages for discrete tags (for example, ON or OFF), on the **Options** menu, click **Show Messages For Discretes**.
6. You can copy and paste data to the Windows clipboard by right-clicking in the data and selecting the appropriate option from the menu that appears.
7. To save the data as a .csv file, on the **File** menu, click **Save As**.
8. To set up a printout of the data, on the **File** menu, click **Page Setup**. Setting up the page works like in any other Windows application.
9. To preview a printout of the data, on the **File** menu, click **Print Preview**. Using the preview window works like in any other Windows application.
10. To print the data, on the **File** menu, click **Print**. Specifying printing options works like in any other Windows application.
11. To exit the dialog box, on the **File** menu, click **Exit**.

### Viewing Statistics

You can view statistics for the data that is retrieved and displayed for a trend. Display statistics include range, average, minimum, maximum, sum, standard deviation, and query properties. Examples of query properties are query time range, start time, end time, and number of rows returned. To display data statistics

1. On the **View** menu, click **Statistics**. The **Statistics** dialog box appears.




© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

Statistics appear in columns as follows.

- Type — The type of tag.
- Tag Name — The name of the tag within the Historian server. If the data values are coming from Application Server, the attribute reference is shown as the tag name. For Application Server attributes, you can also choose to show the hierarchical name along with the attribute reference.
- Server — The server that contains the tag.
- Samples — The number of samples in the trend.
- Minimum — Minimum value for the data that is plotted in the chart.
- Time at Minimum — The time stamp of the minimum value.
- Maximum — Maximum value for the data that is plotted in the chart.
- Time at Maximum — The time stamp of the maximum value.
- Average — Average value for the data.
- Standard Deviation — Standard deviation for the data.
- Range — Value range for the data.
- Timespan — The total amount of time that is spanned by the data.
- From — The starting date for the data.
- To — The ending data of the data.

2. To include only the data that is between the time axis cursors on the chart, on the **Options** menu, click **Data From Between Cursors**.
3. To include all of the data on the chart, on the **Options** menu, click **Data From Between Graph Start/End**.
4. To show actual values for discrete tags (for example, 1 or 0), on the **Options** menu, click **Show Actual Values For Discretes**.
5. To show messages for discrete tags (for example, ON or OFF), on the **Options** menu, click **Show Messages For Discretes**.
6. You can copy and paste data to the Windows clipboard by right-clicking in the log and selecting the appropriate option from the menu that appears.
7. To save the data as a .csv file, on the **File** menu, click **Save As**.
8. To set up a printout of the data, on the **File** menu, click **Page Setup**. Setting up the page works like in any other Windows application.
9. To preview a printout of the data, on the **File** menu, click **Print Preview**. Using the preview window works like in any other Windows application.

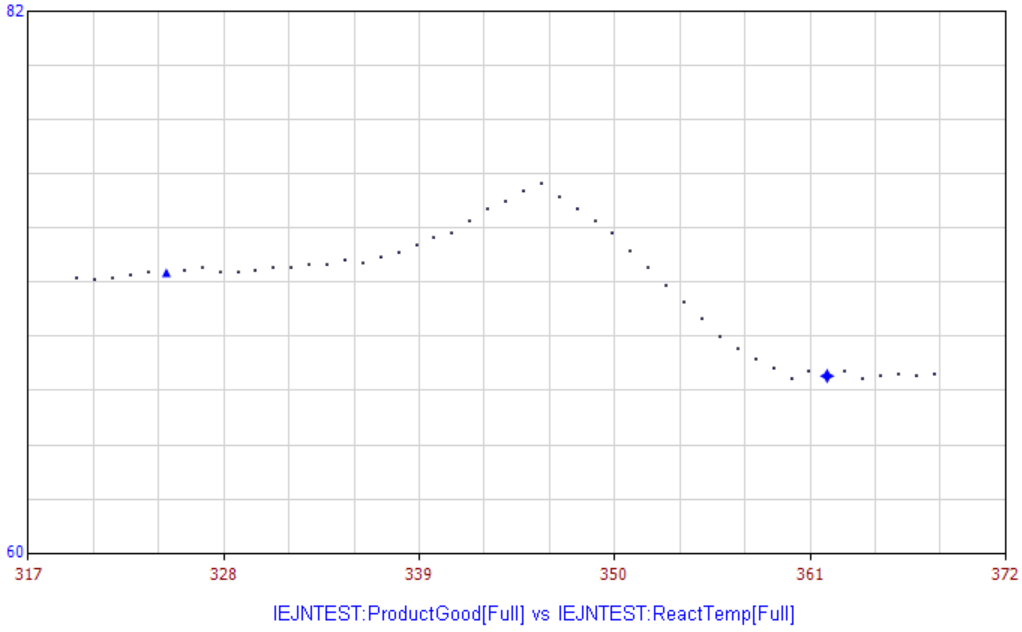
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

10. To print the data, on the **File** menu, click **Print**. Specifying printing options works like in any other Windows application.
11. To exit the dialog box, on the **File** menu, click **Exit**.

## Working with Scatter Plots

In addition to regular trends, you can display data in XY scatter plots. While a regular trend shows the variation of a tag's value over time, a scatter plot shows the variation of a tag's value over the variation of another tag's value. This allows you to see correlations between the two tags.

For example, you could show how product yield varies depending on the reactor temperature in a manufacturing process, and use this information to determine the optimum temperature:

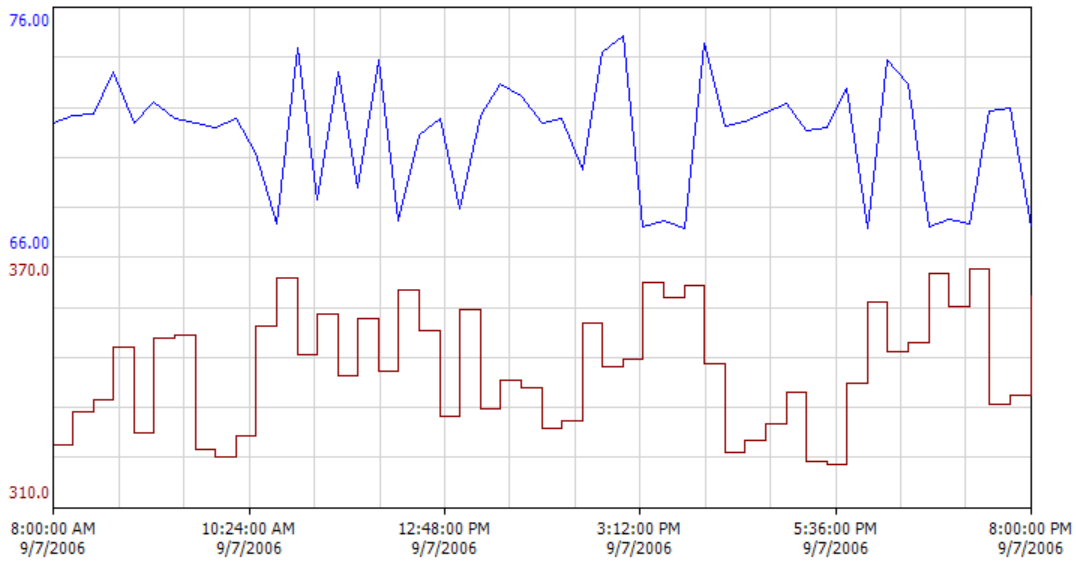



In this example, the X axis represents the reactor temperature as historized by the ReactTemp tag (the "X axis tag"). The Y axis represents the product yield as historized by the ProductGood tag (the "Y axis tag"). For each available data sample of either tag during the chosen time period, a corresponding value for the other tag is matched or interpolated and plotted on the chart.

For more information, see How Are Value Pairs Matched?.

Plotted over time, the two tags look like this:

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




Compared to this type of display, the scatter plot shows the correlation much more clearly.

The following sections show you how to configure a scatter plot and manipulate the display. Many of these features work in a regular trend. Therefore, these sections mainly explain the specific differences when working with scatter plots.

## Viewing Data in a Scatter Plot

Scatter plots show value pairs. As in a geometric coordinate system, every data point in scatter plot must have an X value that determines its horizontal position as well as a Y value that determines the vertical position. On a regular trend, there is no such thing as an "X value" that corresponds to the Y value of a tag; instead, the horizontal position of a tag's value on the chart is determined by the value's time stamp.

On a scatter plot, however, both the X and the Y values must be supplied as tag data. Therefore, you must assign an X axis tag to every tag that you want to view in the scatter plot.

Tags without a corresponding X axis tag are visible in the Tag List, but not in the chart. For more information on how X and Y values are matched, see How Are Value Pairs Matched?

### To configure a scatter plot

1. Click the **New Chart** toolbar button. A new trend chart appears.
2. On the **Chart** menu, in the **Layout** group, select **Scatter**.

   The chart switches into scatter plot mode.
3. Add tags to the chart by double-clicking them in the Tag Picker or dragging them onto the Tag List. For more information on the Tag Picker, see Tag Picker.

   You must add all tags that you want to use as X or Y axis tags. Note the following:

   - One tag can serve as the X axis tag for multiple other tags.
   - If you want to view the same tag against different X axis tags, add it to the Tag List multiple times.
   - While you can add string or event tags, they serve no purpose in a scatter plot. Therefore, these tags are automatically marked as hidden.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

4. Specify a time period for the chart using the time toolbar.
5. Assign an X axis tag to every tag that you want to view in the scatter plot:
   a. Double-click the tagname in the Tag List. The **<ServerName:Tagname>** dialog box appears with the **General** tab selected.
   b. In the **X axis** Tag List, click the name of the tag that you want to use as the X axis tag for this tag. To remove an existing X axis tag association, click the blank entry instead.
   c. Configure other tag options as required. For more information, see Configuring Trend Options for a Tag.
   d. Click **OK**.

   Data for the X/Y tag pairs is retrieved for the specified time period and plotted in the chart. The oldest value pair appears as a triangle-shaped point, and the latest value pair as a diamond-shaped point.

   Tags that do not have an X axis tag assigned to them are shown in italics at the end of the Tag List.

### To quickly assign an X axis tag to a tag

If you do not need to configure any other tag settings, you can use the following steps to quickly assign an X axis tag to a tag that you want to display in a scatter plot (the Y axis tag).

1. Add the Y axis tag to the chart.
2. With the Y axis tag selected in the Tag List, drag the X axis tag from the Tag Picker onto the X axis of the chart.

Alternatively, use these steps:

1. Add the X and Y axis tags to the chart.
2. In the Tag List, click the X axis tag's name and drag it onto the **X Axis Tag** column of the Y axis tag.

## Scaling Tags in a Scatter Plot

Scaling tags in a scatter plot works much like scaling tags in a regular trend. For more information, see Scaling Tags. Note the following:

- Scaling a tag affects the display of all tags that use it as their X axis tag. The display of all other tags remains unchanged. If you want to plot multiple tags against the same X axis tag, but with different X axis scales, you must add the X axis tag to the chart multiple times and assign each tag a different instance of the X axis tag. You can then scale the various instances of the X axis tag individually.
- Rubber band scaling always affects all tags in the chart. It applies to both X axis and Y axis tags. It is not possible to use rubber band scaling for single tag. Rubber band scaling does not affect the chart's time period.
- The scale of the X axis changes as you select different tags in the Tag List. It reflects the scale of the X axis tag associated with the selected tag, or the scale of the tag itself if it does not have an X axis tag. The "multiple scales" option has no effect on the X axis.
- It is not possible to use cursor values as axis labels in a scatter plot.
- Stacking traces is not possible in a scatter plot.

### Configuring Axes in a Scatter Plot

Configuring the axes of a scatter plot works much like configuring the axes of a regular trend. For more information, see Configuring Axis Properties. Note the following:

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- On the **Axes** tab of the **Trend Properties** dialog box, the **X time axis** area only applies to regular trends. For scatter plots, use the **X value axis** area instead.

### How Are Value Pairs Matched?

To plot a data point, the scatter plot must determine which Y value belongs to a given value of the X axis tag and vice versa. This is easy if there are data samples available with the same time stamp for both the X axis tag and the Y axis tag. If there is a sample available for one tag (Tag 1) at time T, but not for the other tag (Tag 2), the missing value is calculated based on the following rules:

- If Tag 2 uses a curve type of "Point" or "Step Line", then the data point uses the latest sample of Tag 2 that is earlier than T.
- If Tag 2 uses a curve type of "Line", then the data point uses the result of a linear interpolation between the two samples of Tag 2 that surround T.

For example, assume you have the following samples available for two tags. Tag 1 uses a trace type of "Step Line." Tag 2 uses a trace type of "Line." A dash indicates that there is no sample at that point in time.

| Time | Value of Tag 1 | Value of Tag 2 |
|---|---|---|
| $t_1$ | $x_{t1}$ | $y_{t1}$ |
| $t_2$ | — | $y_{t2}$ |
| $t_3$ | $x_{t3}$ | — |
| $t_4$ | $x_{t4}$ | $y_{t4}$ |

According to the rules above, the missing value of Tag 1 at $t_2$ is assumed to be $x_{t1}$. The missing value of Tag 2 at $t_3$ is calculated using a linear interpolation between $y_{t2}$ and $y_{t4}$.

If either tag has a NULL sample at a given point in time, the data point is considered "empty," which may result in a gap in the curve.

#### Quality Calculation for Data Points

In the chart display, data points of uncertain, bad, or unknown quality are visually highlighted with special indicators. The overall quality of a data point in a scatter plot depends on the quality of the two tag values of which it is composed. The following table shows the overall quality that results from each possible combination of tag qualities, assuming that both tag values aren't NULL. The top row contains the quality of the first tag, the left column contains the quality of the other tag.

| | Unknown | Uncertain | Bad |
|---|---|---|---|
| **Good** | Unknown | Uncertain | Bad |
| **Unknown** | Unknown | Uncertain | Bad |
| **Uncertain** | Uncertain | Uncertain | Bad |
| **Bad** | Bad | Bad | Bad |

For example, if one tag has good quality and the other tag has bad quality, the data point is highlighted with the indicator for bad quality.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

## Panning and Zooming in a Scatter Plot

Panning and zooming affect the time period used in a chart. For a scatter plot, this means that panning or zooming moves, enlarges or reduces the time period for which data is retrieved. This may result in more or fewer data points being available for display. Depending on the nature of the data, this may or may not change the visual appearance of the chart—unlike in a regular chart, where panning or zooming inevitably changes the display.

To reflect this, the panning commands in the **Chart** menu are called **Pan Earlier** and **Pan Later** in a scatter plot, as opposed to **Pan Left** and **Pan Right** in a regular trend. However, they still work the same way. The zooming options are identical. For more information, see Panning in the Trend Chart and Zooming.

## Defining a Target Region for a Scatter Plot

You can configure a target region for each tag displayed in a scatter plot as you configure in a regular trend. For an overview of what a target region does, see Defining a Target Region for a Tag.

Configuring a target region for a scatter plot tag is very similar to configuring one for a regular trend. The main difference is that the target region isn't defined by high and low boundaries at certain points in time, but by a series of X/Y value pairs. The target region is determined by connecting the X/Y points in the order they are given. For some examples, see Examples for Target Regions in Scatter Plots.

### To configure a target region for a scatter plot tag

- Follow the procedure given under To configure a target region for a trend tag. The only difference is that when importing a CSV file or pasting clipboard data, each row must contain a region item that is composed of two items instead of three. The first item is the X value, the second item is the Y value.

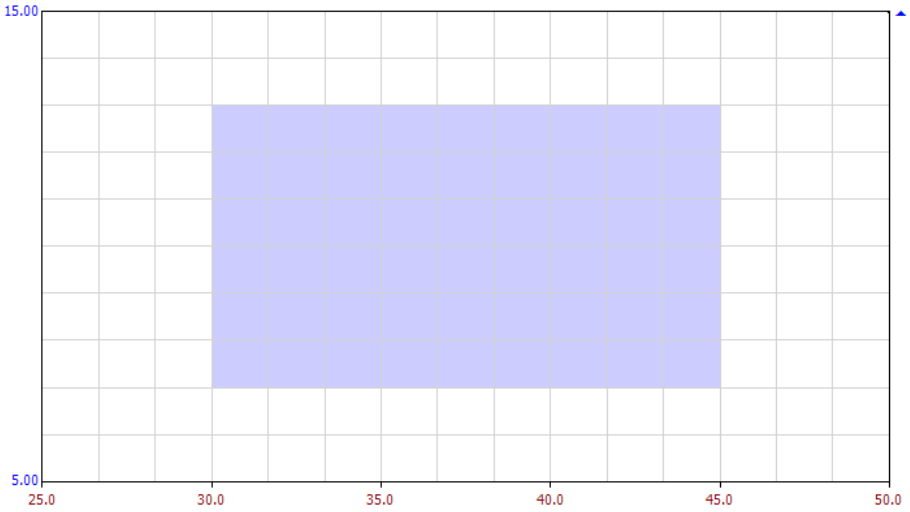
#### Examples for Target Regions in Scatter Plots

When defining a scatter plot target region, listing the same X/Y points in different order can result in very different target regions. For example, assume that you define the following X/Y points:

| X | Y |
|---|---|
| 30 | 7 |
| 30 | 13 |
| 45 | 13 |
| 45 | 7 |

The resulting target region looks like this:

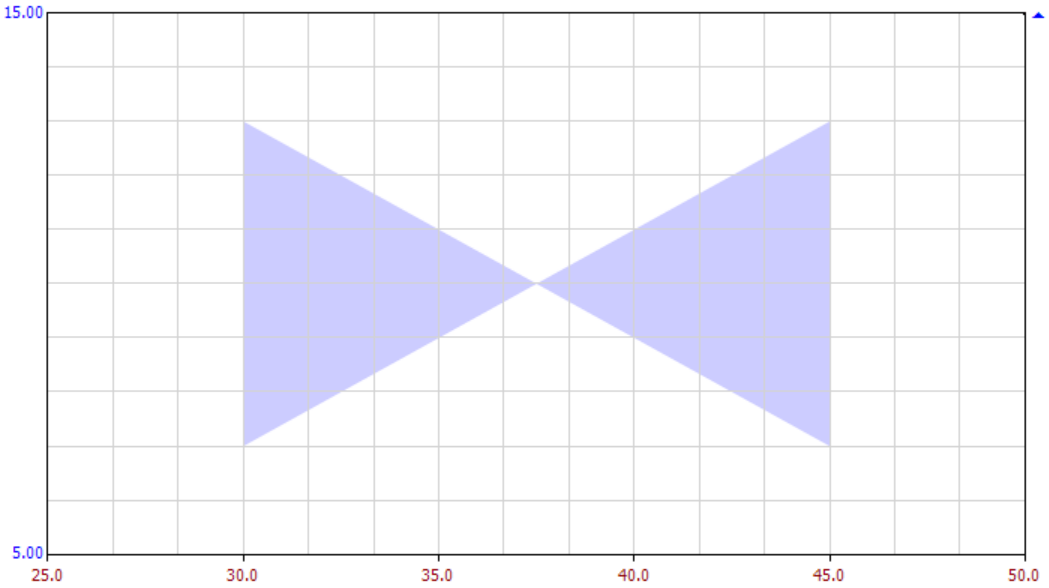
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




Because the points are connected in the order they are defined, reordering the points results in a different target region. Assume that you reorder the same points like this:

| X | Y |
|---|---|
| 30 | 7 |
| 30 | 13 |
| 45 | 7 |
| 45 | 13 |

The resulting target region looks like this:



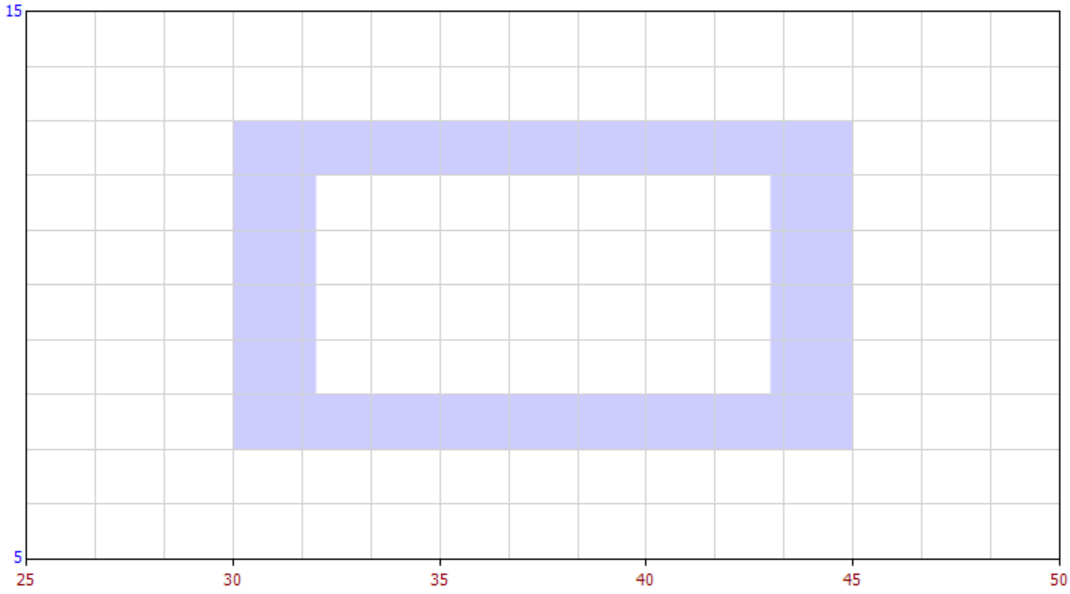

You can also create target regions with a "hole" in the middle. For example, use the following points:

| X | Y |
|---|---|
| 30 | 7 |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| 30 | 13 |
| 45 | 13 |
| 45 | 7 |
| 30 | 7 |
| 32 | 8 |
| 32 | 12 |
| 43 | 12 |
| 43 | 8 |
| 32 | 8 |

The resulting target region looks like this:




## Configuring Scatter Plot Properties

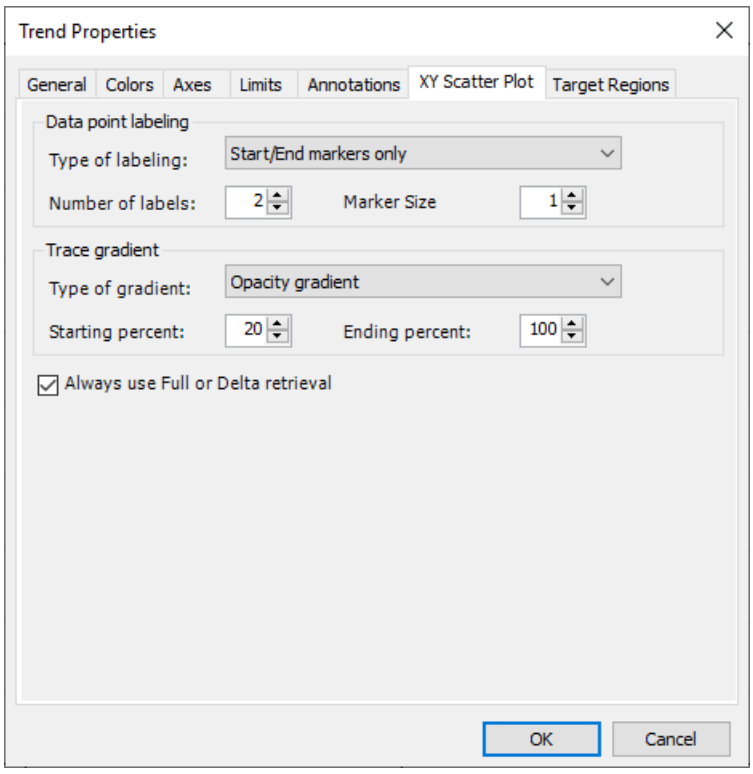
You can set up a scatter plot to show time labels on the data points and use an opacity gradient for line traces to indicate the sequence of data points in time.

Also, you can override the tags' data retrieval settings so that full or delta mode retrieval is always used in scatter plots.

### To configure scatter plot properties:

1. On the **Chart** menu, click **Properties**. The **Trend Properties** dialog box appears.
2. Click the **XY Scatter Plot** tab.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




3. In the **Data point labeling** area, configure the following options:

- Type of labeling

| Selected Option | Result |
|---|---|
| Start/End markers only | Start/end markers are displayed, with no time labels on the data points |
| Start/End markers with time labels on current tag | Start/end markers are displayed, along with time labels on the data points |
| Start marker only | Start markers are displayed, but end markers are not displayed |
| End marker only | End markers are displayed, but start markers are not displayed |
| No marker and time labels | No markers or time labels are displayed |

- Number of labels — The number of time labels that appear on the chart. The valid range is from 2 to 15, with a default value of 6. The labels are spaced evenly over the time period between the earliest and the latest data point in the chart. (Therefore, they may not be spaced evenly in distance.)
- Marker Size — The size to display the start/end markers in the chart. The valid range increases in size from from 1 to 5, with a default value of 1.

4. In the **Trace gradient** area, configure the following options:

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- Type of gradient — Select **Opacity gradient** if you want the opacity of the line trace in a scatter plot to change based on the time stamp of the data points that it connects. For example, the trace could be fully opaque at the most recent data point and almost transparent at the oldest data point. Select **None** if you want the trace to have the same opacity at all data points.
- Starting percent — The opacity of the trace at the oldest data point. 0 means transparent, 100 means fully opaque.
- Ending percent — The opacity of the trace at the most recent data point.

5. Select the **Always use Full or Delta retrieval** check box if you always want to use Full or Delta mode retrieval for all tags in a scatter plot regardless of the retrieval settings that are configured at the application or tag level. Full retrieval is used when retrieving data from a Historian with a version of 9.0 or higher. Delta retrieval is used for earlier server versions. We recommend to keep this option enabled unless the nature of your data makes full retrieval impractical.
6. Click **OK**.

### Other Considerations for Working with Scatter Plots

Also note the following when working with scatter plots:

- **Retrieval:** If a tag is neither associated with an X axis tag nor acting as an X axis tag itself, no data is retrieved for it. Therefore, the data logs do not show any data for such tags.
- **Cursors:** You can work with cursors similar to regular trend. However, the cursor commands in the **View** menu are called **X Value Axis Cursors** and **Y Value Axis Cursors** instead of **Time Axis Cursors** and **Value Axis Cursors**.
- **Curve type:** If a tag has a curve type of "Line" or "Step Line," its data points are connected in chronological order. Depending on the nature of the data, changing the curve type to "Point" may result in a clearer display.
- **Switching between chart types:** Trend options that aren't applicable to a scatter plot are disabled and/or ignored when you switch the chart type from regular trend to scatter plot. However, their values are generally retained so that they are still available if you switch the chart type back to regular trend.

## Using Annotations

You can use Trend to make an annotation for a tag at any point in time. An annotation is a user comment about a tag. For example, you might want to save a comment about a very high spike in a trend. You can create an annotation for the value of the tag at the spike. All annotations are saved to the database and can be retrieved again at a later time.

You can create a private annotation (that only you can see) or a public annotation (which is viewable by all trend users). Private annotations are only available to the users who created them and have suitable access.

For each annotation, an annotation mark (solid circle) is added to the trend. This annotation mark can be viewed on the trend if the trend properties are set to allow it.

When you make an annotation, the following information is stored in the Annotation table in the Runtime database of the Historian:

- Name of the tag for which the annotation is associated.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- The date/time of the annotation. The time of the annotation is based on the position of where it was created on the time axis.
- The value of the tag at the time of the annotation.
- The annotation text.

**Note:** You cannot use the Annotations functionality when connected to a Managed Historian.

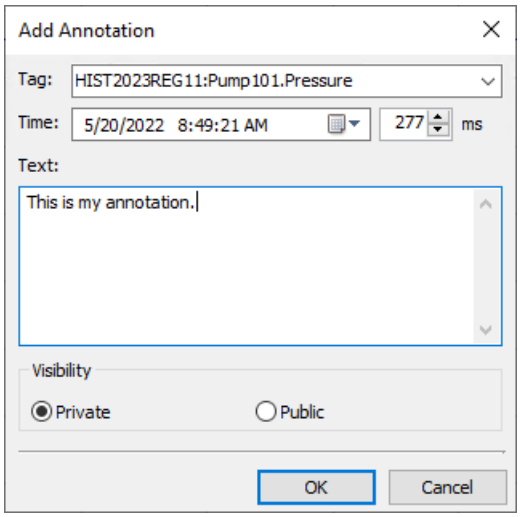
### Adding an Annotation

Annotations are inserted in the chart at the location where the mouse button is clicked and are associated with the selected tag's value where the mouse button is clicked.

#### To add an annotation

1. Select the tag for which you want to add an annotation. You can do this by selecting the tag in the Tag List pane.
2. Do one of the following:
   - On the **Chart** menu, click **Add Annotation**.
   - Right-click in the chart. In the shortcut menu that appears, click **Add Annotation**.

   The **Add Annotation** dialog box appears.




3. In the **Tag** List, click the name of the tag for which you want to add the annotation.
4. In the **Time** list, click the time stamp of the tag value for which you want to add the annotation.
5. In the **Text** window, type in your comment.
6. In the **Visibility** area, specify if you want the annotation to be visible to others. Click **Private** to have annotations only visible to you.Click **Public** to have annotations visible to anyone who is able to log on to the database.
7. Click **OK**.

   An annotation marker (dot) appears on the chart at the point on the chart where the annotation was made.

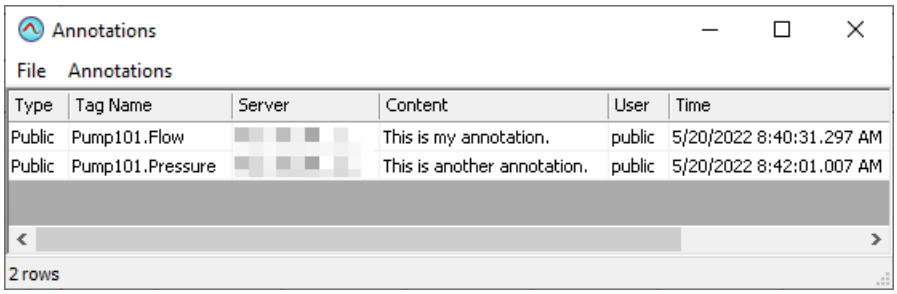
   If you hover with the mouse on the marker, the details for the annotation will appear on the chart.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

## Viewing the Annotation List

### To view a list of annotations

1. On the **View** menu, click **Annotations**. The **Annotations** dialog box appears.




   The table shows the following information:

   - Type — Specifies whether the annotation is public.
   - Tag Name — The name of the tag within the Historian server. If the data values are coming from application server, the attribute reference is shown as the tag name. For application server attributes, you can also choose to show the hierarchical name along with the attribute reference.
   - Server — The name of the server that stores the tag values.
   - Content — The annotation text.
   - User — The name of the database user. This is the user that created the annotation.
   - Time — The timestamp of the tag value for which the user has made an annotation.
   - Created On — The date that the annotation was created.

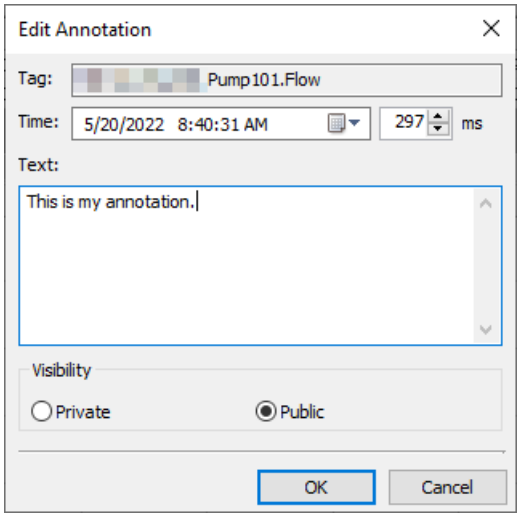
2. To sort the table according to the information in a particular column, click the column heading. Click again to reverse the sorting order.

## Editing an Annotation

### To edit an annotation

1. On the **View** menu, click **Annotations**. The **Annotations** dialog box appears.
2. Select the annotation in the list.
3. On the **Annotations** menu, click **Edit**. The **Edit Annotation** dialog box appears.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




4. Edit the annotation.
5. Click **OK**.

## Deleting an Annotation

Deleting an annotation removes the annotation from the trend.

### To delete an annotation

1. On the **View** menu, click **Annotations**. The **Annotations** dialog box appears.
2. Select the annotation in the list.
3. On the **Annotations** menu, click **Delete**. Confirm the deletion.
4. Click **OK**.

## Saving the Annotations List as a .CSV File

### To save the list of annotations as a .csv (text) file

1. On the **View** menu, click **Annotations**. The **Annotations** dialog box appears.
2. On the **File** menu, click **Save As**. The standard Windows **Save As** dialog box appears.
3. In the **File name** box, type a name for the .csv file.
4. Browse to the location in which to save the file.
5. Click **Save**.

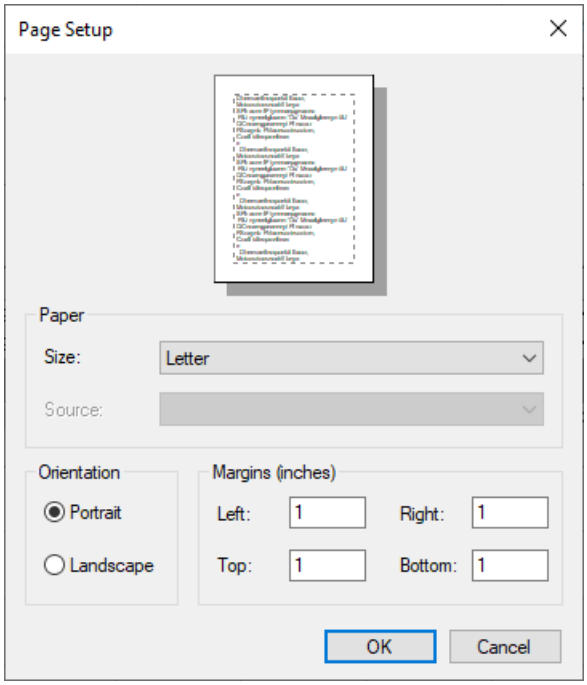
The .csv file contains the same information that appears in the **Annotations** dialog box.

## Printing Annotations

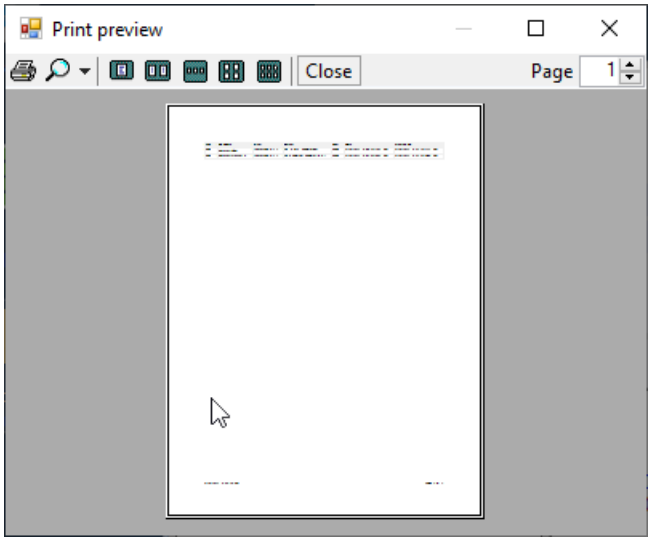
### To print the list of annotations

1. On the **View** menu, click **Annotations**. The **Annotations** dialog box appears.
2. To configure the printing options, on the **File** menu, click **Page Setup**. The **Page Setup** dialog box appears.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

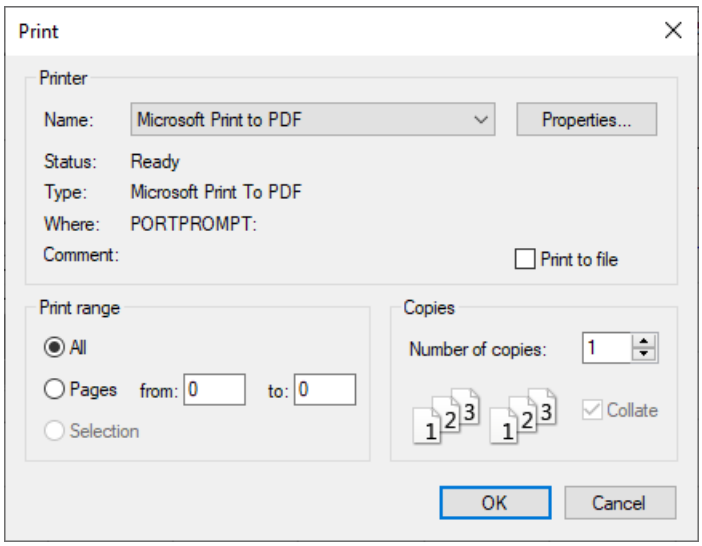



3. Configure the setup options and then click **OK**.
4. To preview the printout, on the **File** menu, click **Print Preview**. The **Print preview** dialog box appears.




5. Verify the preview and then click **Close**.
6. To print the annotations, on the **File** menu, click **Print**. The **Print** dialog box appears.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




7. Configure the printing options and then click **OK**.

## Working with Trend Files

This section describes how to create, open, and save trend files. A trend file contains all of the configuration data required to trend one or more tags, such as the tags, time axes, colors, zoom level, and so on.

Any mix of analog, discrete, event, or summary tags is allowed. However, the mix of summary tags with other tags is dependant on the retrieval mode. For example, if the summary tags are supported by Cyclic retrieval mode and that retrieval mode is set, then we can mix the summary tags with the other tags for trending.

There is no pre-set limit to the number of tags that you can have in a trend; however, keep in mind performance limitations for data retrieval for your computer system.

### Creating a New Trend

Creating a new trend chart resets all trend settings to the default values.

**To create a new trend**

- On the **File** menu, click **New**.

To configure the new trend, see Configure a Trend. By default, the new trend is in standard trend mode. To create an XY scatter plot, see Viewing Data in a Scatter Plot.

### Configuring Default Settings for a Trend File

You can configure default settings for a trend in a "Default.aaTrend" file and use it as a template for your new trend documents.

The trend properties such as border thickness, border style, background color, Tag List pane height and columns, and pens and their properties are saved in the Default.aaTrend file.

When you start the Trend application or Trend control for the first time, the Default.aaTrend file is created in:

C:\Users\<User>\AppData\Local\Wonderware\ActiveFactory\Trend

**To configure the default settings**

1. Create a new trend file. For more information, see Creating a New Trend.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

2. Configure the default settings such as the background color, pen color, and trend chart views.
3. Save the file as Default.aaTrend in the default location.
4. Restart the Trend application.

The default settings are applied to the new trend documents. To restore the default trend settings, delete the Default.aaTrend file and create a new trend document.

## Opening an Existing Trend

### To open an existing trend

1. On the **File** menu, select **Open**.
2. Select **Trend** to open a single trend file.

   The standard Windows **Open** dialog box appears.
3. Browse to and select the trend file to open. All trend files have the .aaTrend extension.
4. Click **Open**. The trend appears in the chart.

**Note:** You can also double-click the .aaTrend file in the Windows Explorer to start up Trend.

### To open a recent trend

- From the **File** menu, locate the file in **Recent Files**, and then double-click the name of the file to open.

## Saving a Trend

### To save a trend

1. From the **File** menu, select **Save**.
2. Click the **Save** button 

.

   If you are saving the trend for the first time, the standard Windows **Save As** dialog box appears. Otherwise, the trend is saved to disk using the existing file name.
3. In the **Save As** dialog box, type a name for the trend. All trend files have the .aaTrend extension.

**Note:** The trend files with .aaTrend extension are not encrypted.

1. Click **OK**.

### To save a trend as another name

1. From the **File** menu, select **Save**.
2. Click **Save As**.

   The standard Windows **Save As** dialog box appears.
3. In the **Save As** dialog box, type a name for the trend. All trend files have the .aaTrend extension.

**Note:** The trend files with .aaTrend extension are not encrypted.

1. Click **OK**.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Closing a Trend

#### To close a trend

Do one of the following:

- On the **File** menu, click **Close**.
- Click the trend window's close button ×.

### Undoing/Redoing Actions

The trend application supports 64 levels of undo/redo. You can undo/redo all of the actions for scaling and moving, as well as for adding and removing tags in the trend.

#### To undo an action

- Click the **Undo** ↶ toolbar button

#### To redo an action

- Click the **Redo** ↷ toolbar button

## Outputting Trend Data

You can output trend data to a printer, a .csv file, or to an image file, such as .bmp, jpeg, and .gif. You can also copy and paste the trend graph and associated Tag List to the Windows Clipboard.

**Note:** The capability to output a trend to an image file is available only in System Platform 2020 R2 SP1 and later.

### Printing Trend Data

Before you print a chart, you can specify print options and preview the printout. Use the following commands:

- To set up the print page: From the **Home** menu, in the **Print** group, click **Setup**.
- To preview the print output: From the **Home** menu, in the **Print** group, click **Preview**.
- To print the chart: From the **Home** menu, in the **Print** group, click **Print**.

The available options for these commands work like in any other Windows application.

**Note:** When you print a chart, only the data that is currently displayed in the application appears in the printout. For example, if part of the Tag List is not displayed in the application, then that portion does not appear in the printout.

### Printing Trend Sets

A trend set is a saved grouping of trend files. You can specify a common trend duration (for example, the last 24 hours) to apply to all of the files in the set.

This allows you to easily print information for the same duration from multiple trend files at the same time.

#### Printing a Trend Set

#### To print a trend set

- From the **File** menu, in the **Print** group, click **Print**.

If you double-click a trend set in Windows Explorer, the trend set opens in the Historian Client Trend application, the associated trends are printed, and then the application closes automatically.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

You can also print a trend set from a command prompt by executing the trend set filename, including the extension:

```
aatrend /s <fully qualified filename>
```

To have the Trend application automatically close after the trend set is printed, omit the `/s` parameter.

### Saving Trend Data to a .CSV File

When you save trend data, all data is exported to comma separated values (.csv) format. The .csv file includes all time stamps and values for the tags on the current trend chart at the time of the save.

#### To save trend data

1. From the **File** menu, select **Save**.
2. Select **Save data**.

   The standard Windows **Save As** dialog box appears.
3. Browse to the location in which you want to save the file.
4. In the **File name** box, type a name for the trend data file.
5. Click **Save**.

You can view the data in any spreadsheet application that can open .csv files, such as Microsoft Excel.

If you do not want the data values to be blank unless the value is NULL, use the Cyclic retrieval style and add the following entry into the win.ini file:

```
[HistClient]
KeepAllTrendPoints=1
```

### Saving the Trend Chart to an Image File

You can save a trend chart to a .bmp, .gif, .jpeg, .svg, or .png image file.

**Note:** The capability to output a trend to an image file is available only in System Platform 2020 R2 SP1 and later.

#### To save the trend chart

1. From the **File** menu, select **Save**.
2. Click **Save Image**.

   The standard Windows **Save As** dialog box appears.
3. Browse to the location in which you want to save the file.
4. In the **File name** box, type a name for the trend image file.
5. In the **Save as Type** box, select an image type.
6. Click **Save**.

### E-mailing a Trend File

To e-mail a trend file, you must have a valid SMTP server and account configured and an e-mail application correctly installed and configured with a suitable e-mail account.

Before you e-mail a trend, make sure to save the trend file on your computer.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

**To e-mail a trend file**

1. From the **Home** menu, in the **Export** group, select **Send To**. The e-mail program starts up and a new message appears.

**Note:** By default, the trend file that you want to send does not have a *.aaTrend file extension.

1. Remove the attachment and then browse to the location and attach the trend file that includes the trend *.aaTrend file as an extension.
2. Use the e-mail program to send the trend file.

### Copying a Trend Chart to the Windows Clipboard

When you copy a trend chart, only the data that is currently displayed in the application is copied. For example, if part of the associated Tag List is not displayed in the application, then that portion is not copied.

**To copy a trend chart**

1. Click in the trend chart so that it has focus.
2. From the **Home** menu, in the **Clipboard** group, click **Copy**.
3. Open the target application (for example, Microsoft Word).
4. Paste the chart.

   The trend chart is pasted as a graphic in the target application.

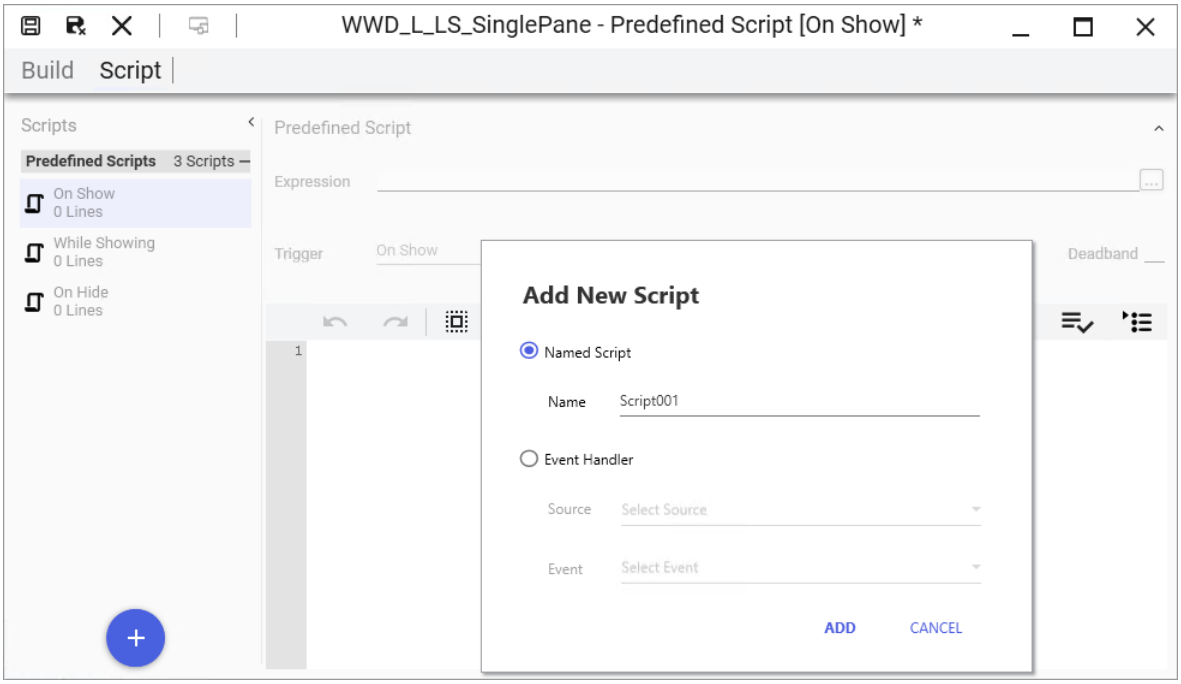
## Historical Trend Pen Scripts

The HistoricalTrendApp can show the underlying .NET Winforms and Windows Presentation Foundation (WPF) control properties, methods, and events in addition to the native properties and methods included with the app.

The underlying control properties appear on the Layout editor **Properties** grid after placing the HistoricalTrendApp onto a layout pane. Because of the large number of underlying control properties, use the Layout editor's search function to find a control property.

HistoricalTrendApp methods, properties, and events can be used by the Layout script editor to create named and event handler scripts.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




For more information about writing scripts with the Layout editor, see Layout Scripts.

## Write a HistoricalTrendApp Named Script

You can write named and event handler scripts from the Layout editor after the HistoricalTrendApp has been placed onto a layout pane. The Layout script editor supports the MyContent namespace to write named scripts specifically for the HistoricalTrendApp when it is content placed on a layout pane.

The Layout script editor includes the AutoComplete feature, which shows a positional drop-down list of namespaces, content types, and the methods or properties associated with HistoricalTrendApp content.

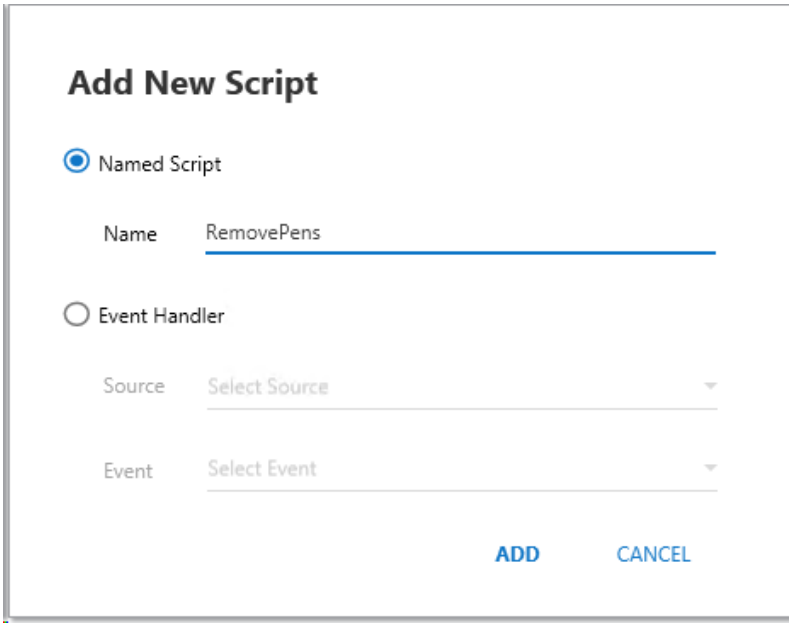
### Write a HistoricalTrendApp named script

1. Open the layout and show the items listed in the **Toolbox** tab.
2. Select the HistoricalTrendApp from the **Toolbox** list to show its preview thumbnail.

   The **Toolbox** pathway to the HistoricalTrendApp is:

   _Default Content > 4. Apps > AVEVA OMI Apps > HistoricalTrendApp
3. Drag and drop the preview thumbnail onto a layout pane.
4. Select **Script** from the menu bar of the Layout editor to open the script editor.
5. Create a named script.
   a. Select the red plus circle to show the **Add NewScript** dialog box.
   b. Select **Named Script**, assign a name to the script, and select **Add** to close the dialog.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




The new script appears beneath the **Named Scripts** area at the left of the editor and the window focus is set to the script canvas to begin writing script code.

6. Enter your script code.

   A named script intended for a HistoricalTrendApp placed on a layout pane uses the MyContent namespace and its content name is assigned by its **Name** property in the Properties grid of the Layout editor. Place a period immediately after the item you selected from the AutoComplete list. AutoComplete shows the next positional list of items based on your previous selections in the script statement.

   AutoComplete provides a list of properties and methods that can be included in the script based on the MyContent.*NameProperty* prefix of the script statement.

   - For .NET methods and properties, refer to .NET documentation on the Microsoft web site.
   - For descriptions of legacy HistoricalTrendApp methods and properties, refer to the *ArchestrA Trend Client User Guide* that is delivered with System Platform 2020. The document is a PDF file located on the computer hosting the System Platform IDE.

     C:\Program Files (x86)\ArchestrA\Framework\Docs\1033\aaTrendClient.pdf

7. Validate your script code using the script validation tool shown at the right of the script editor menu bar.

8. After making any script corrections, save and exit from the Layout script editor.

## Write an Event Handler Script

You can write event handler scripts by two methods after placing the HistoricalTrendApp onto a layout pane.

- Assigning values to the **Available Events** property on a selected control's **Properties** grid

  You select an event from a list of all available events of the control to create an event handler.

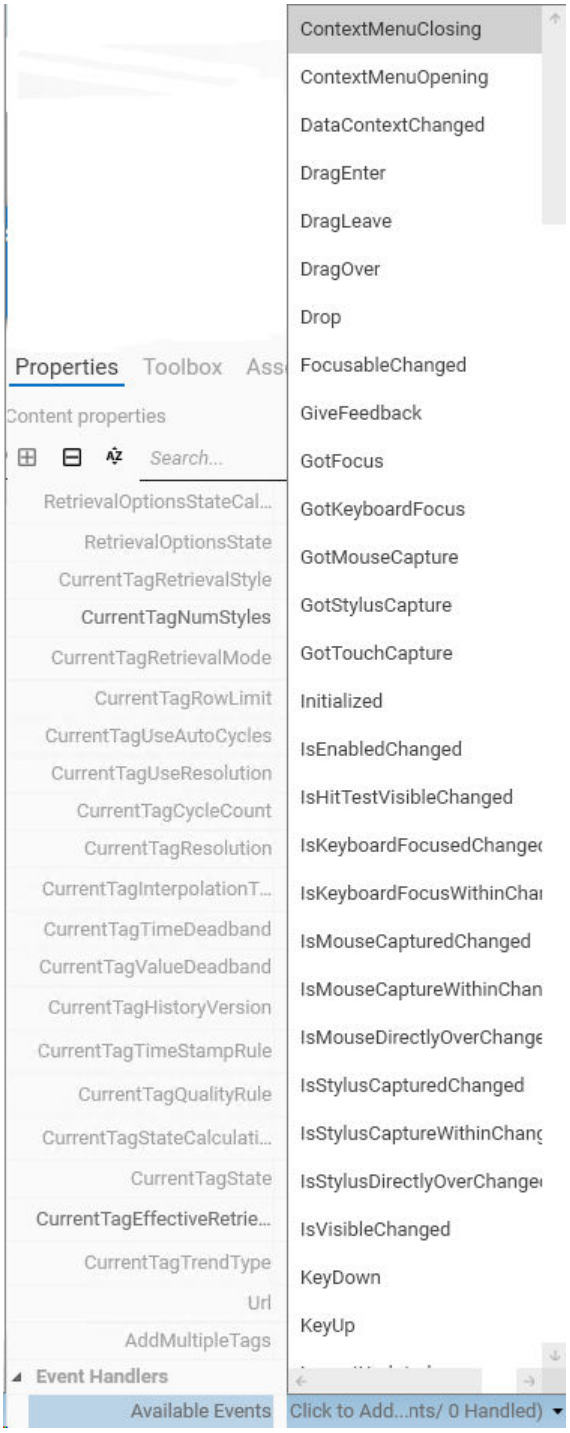
- Add a new event handler script from the Layout script editor's **Add New Script** dialog.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

The following topics describe the workflows to create an event handler script by these two methods.

### Write an Event Handler Script from the Properties Grid

The underlying control of the HistoricalTrendApp includes a set of public properties, methods, and events that can be viewed fom the Layout editor's **Properties** grid. Near the bottom of the Properties grid is the **Available Events** property, which shows a list of HistoricalTrendApp events after being selected.




© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

After selecting a public HistoricalTrendApp event from the list, the Layout script editor opens to code the event handler script.

### Write an Event Handler Script Using Available Events Property of the HistoricalTrendApp

1. Open the Layout editor and show the items listed in the **Toolbox** tab.
2. Select the HistoricalTrendApp from the **Toolbox** list to show its preview thumbnail.

   The **Toolbox** pathway to the HistoricalTrendApp is:

   _Default Content > 4. Apps > AVEVA OMI Apps > HistoricalTrendApp

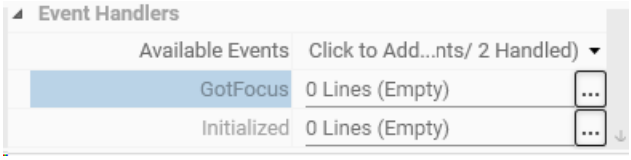
   The preview thumbnail of the HistoricalTrendApp appears beneath the list of **Toolbox** items.
3. Drag and drop the preview thumbnail of the HistoricalTrendApp onto a layout pane.
4. Select the pane where the HistoricalTrendApp has been placed and select the **Properties** grid.

   HistoricalTrendApp properties appear in the grid. HistoricalTrendApp events appear in a list of the **Available Events** property.
5. Select the data entry field of the **Available Events** property to show a list of events.

   Events are listed in alphabetic order.
6. Select one or more events from the list.

   A selected handled event name appears in bold text to indicate that it is selected.

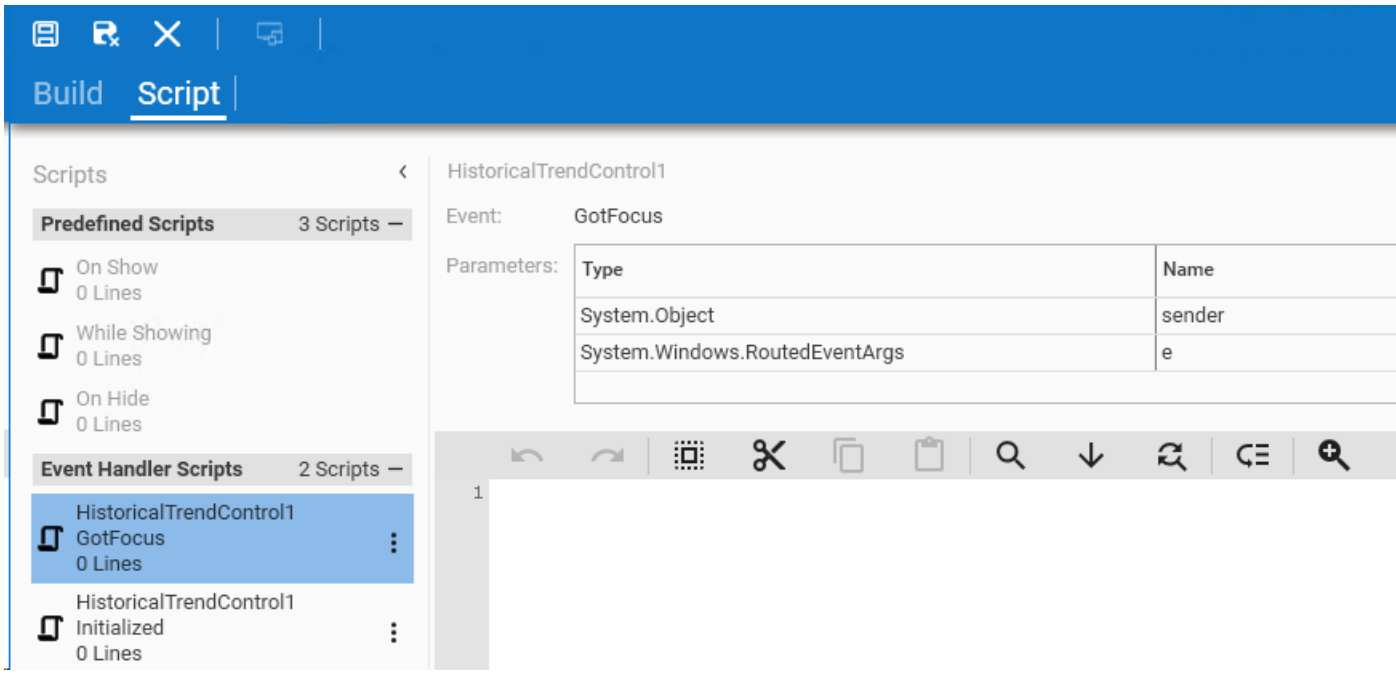
   The **Available Events** property updates to show each selected handled event with a data entry field.




   All handled events without any script lines are listed in alphabetic order.
7. Select the button at the right of the selected event's data entry field.

   The Layout script editor opens with the selected handled events listed beneath the **Event Handler Scripts** column.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




The **Event** field shows the selected event script from the list.

8. Enter script code for each event handler.

   The number of lines in each event handler script are shown in the Available Events property of the Layout editor.

9. Validate your script code by selecting the validation button at the right on the menu bar above the script edit area.

10. Save your scripts and exit from the Layout script editor.

## Write an Event Handler Script from the Layout Script Editor

Event Handler scripts can be created with the **Add New Script** dialog box of the Layout script editor. Handled events can be selected for the **Event** list of the **Add New Script** dialog box.

### Write an HistoricalTrendApp event handler script from the control Properties page

1. Open the layout and show the items listed in the **Toolbox** tab.
2. Select the HistoricalTrendApp from the **Toolbox** list to show its preview thumbnail.

   The **Toolbox** pathway to the HistoricalTrendApp is:

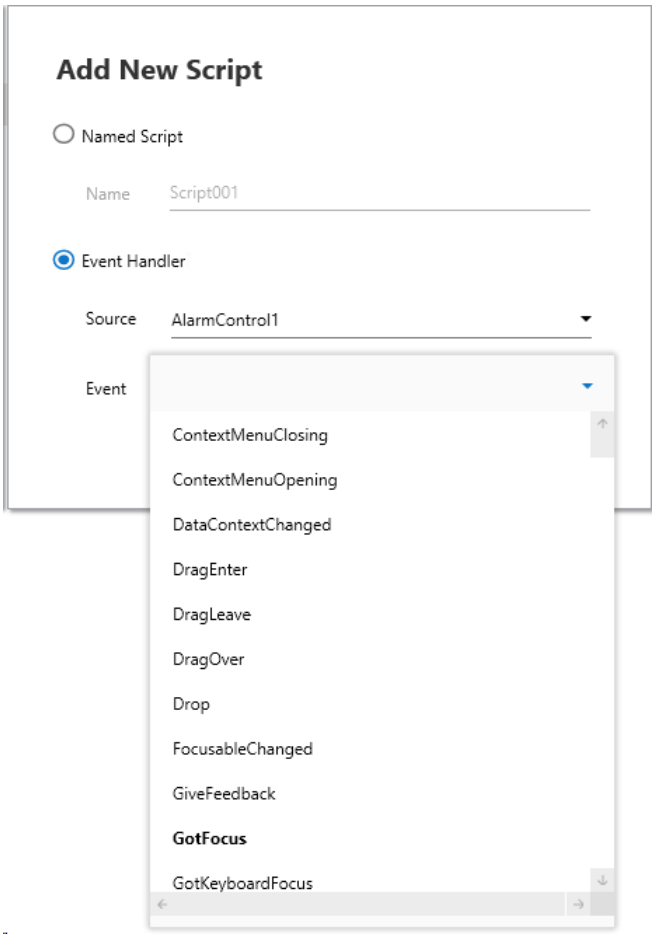
   _Default Content > 4. Apps > AVEVA OMI Apps > HistoricalTrendApp

3. Drag and drop the preview thumbnail onto a layout pane.
4. Select **Script** from the menu bar of the Layout editor to open the script editor.
5. Create an event handler script.
   a. Within the Layout script editor, select the red plus circle to show the **Add NewScript** dialog box.
   b. Select **Event Handler**.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

c. Select the name of the AlarmControl placed on the layout pane from the **Source** list.

d. Select the data field of **Event** to show a list of event handlers.




e. Select one or more event handlers from the list.

f. Select **Add** to close the **Add New Script** dialog box and return to the Layout script editor.

The **Event Handler Scripts** area shows the selected event handlers in alphabetic order.

6. Select an event handler from the list and enter script code for each event handler.

The number of lines in each event handler script are shown in the **Available Events** property of the Layout editor.

7. Validate your script code by selecting the validation button at the right on the menu bar above the script edit area.



8. Save your scripts and exit from the Layout script editor.

The new event handler scripts appears beneath the **Event Handler Scripts** area at the left of the editor and the window focus is set to the script edit area to begin writing script code.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Data Retrieval Options

You can use a variety of retrieval modes and options to suit different reporting needs and applications.

## Understanding Retrieval Modes

Different retrieval modes allow you to access the data stored in an AVEVA Historian in different ways. For example, if you retrieve data for a long time period, you might want to retrieve only a few hundred evenly spaced data points to minimize response time. For a shorter time period, you might want to retrieve all values that are stored on the server to get more accurate results.

An AVEVA Historian with a version earlier than 9.0 supports two retrieval modes:

- Cyclic Retrieval
- Delta Retrieval

An AVEVA Historian with a version of 9.0 or higher supports various additional modes:

- Full Retrieval
- Interpolated Retrieval
- "Best Fit" Retrieval
- Average Retrieval
- Minimum Retrieval
- Maximum Retrieval
- Integral Retrieval
- Slope Retrieval
- Counter Retrieval
- ValueState Retrieval

An AVEVA Historian with a version of 10.0 or higher supports the following additional mode:

- RoundTrip Retrieval

An AVEVA Historian version 11.6.14101 or higher supports the following additional mode:

- Predictive Retrieval (see Predictive Filter on page 306)

An AVEVA Historian with a version of 17.3.100 or higher supports the following additional mode:

- Bounding Value Retrieval

### Cyclic Retrieval

Cyclic retrieval is the retrieval of stored data for the given time period based on a specified cyclic retrieval resolution, regardless of whether or not the value of the tag(s) has changed. It works with all types of tags. Cyclic retrieval produces a virtual rowset, which may or may not correspond to the actual data rows stored on the Historian.

In cyclic retrieval, one row is returned for each "cycle boundary." You specify the number of cycles either directly or by means of a time resolution, that is, the spacing of cycle boundaries in time. If you specify a number of cycles, the Historian returns that number of rows, evenly spaced in time over the requested period. The cyclic

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

resolution is calculated by dividing the requested time period by the number of cycle boundaries. If you specify a resolution, the number of cycles is calculated by dividing the time period by the resolution.

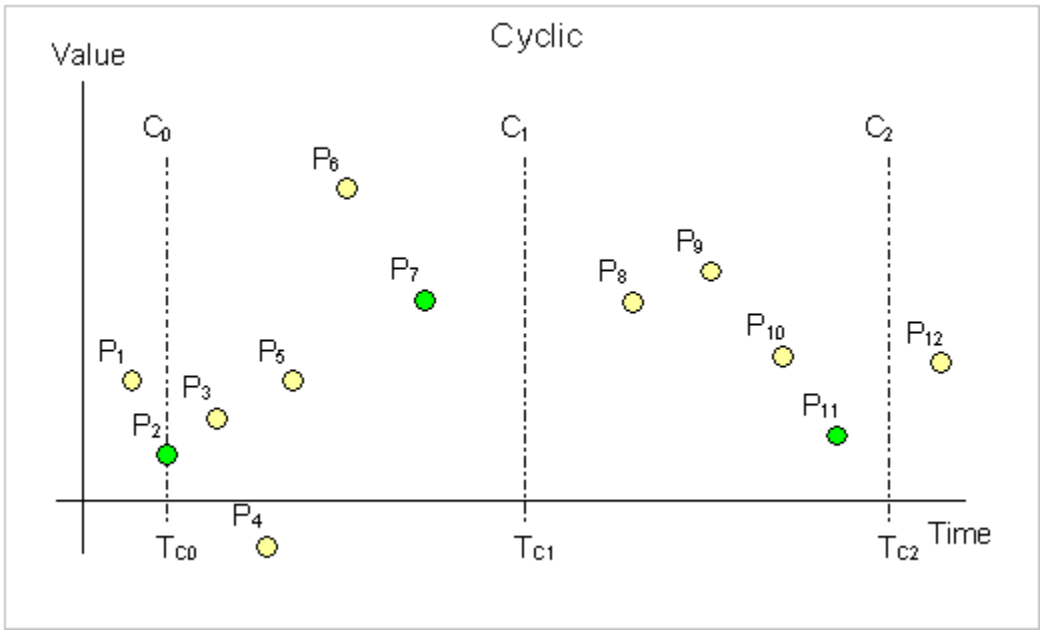
If no data value is actually stored at a cycle boundary, the last value before the boundary is returned.

The default retrieval mode is cyclic for retrieval from analog tables, including analog and state summary tables.

Cyclic retrieval is fast and therefore consumes little server resources. However, it may not correctly reflect the stored data because important process values (gaps, spikes, etc.) might fall between cycle boundaries. For an alternative, see "Best Fit" Retrieval.

### Cyclic Retrieval - How It Works

The following illustration shows how values are returned for cyclic retrieval:




Data is retrieved in cyclic mode with a start time of $T_{C0}$ and an end time of $T_{C2}$. The resolution has been set in such a way that the Historian returns data for three cycle boundaries at $T_{C0}$, $T_{C1}$, and $T_{C2}$. Each dot in the graphic represents an actual data point stored on the Historian. From these points, the following are returned:

- At $T_{C0}$: $P_2$, because it falls right on the cycle boundary
- At $T_{C1}$: $P_7$, because it is the last point before the cycle boundary
- At $T_{C2}$: $P_{11}$, for the same reason

### Cyclic Retrieval - Supported Value Parameters

You can use various parameters to adjust which values are returned in cyclic retrieval mode. For more information, see the following sections:

- Cycle Count (X Values over Equal Time Intervals) (wwCycleCount).
- Resolution (Values Spaced Every X ms) (wwResolution).
- History Version (wwVersion).
- Timestamp Rule (wwTimestampRule) (only on Historian 9.0 and above).

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Cyclic Retrieval - Query Examples

To use the cyclic retrieval mode, set the following parameter in your query.

```
wwRetrievalMode = 'Cyclic'
```

### Cyclic Retrieval - Initial Values

No special handling is done for initial values. The initial value will behave like a normal cycle boundary at the start time. For information on initial values, see Delta Retrieval - Initial Values.

### Cyclic Retrieval - Handling NULL Values

No special handling is done for NULL values. They are returned just like any other value.

## Delta Retrieval

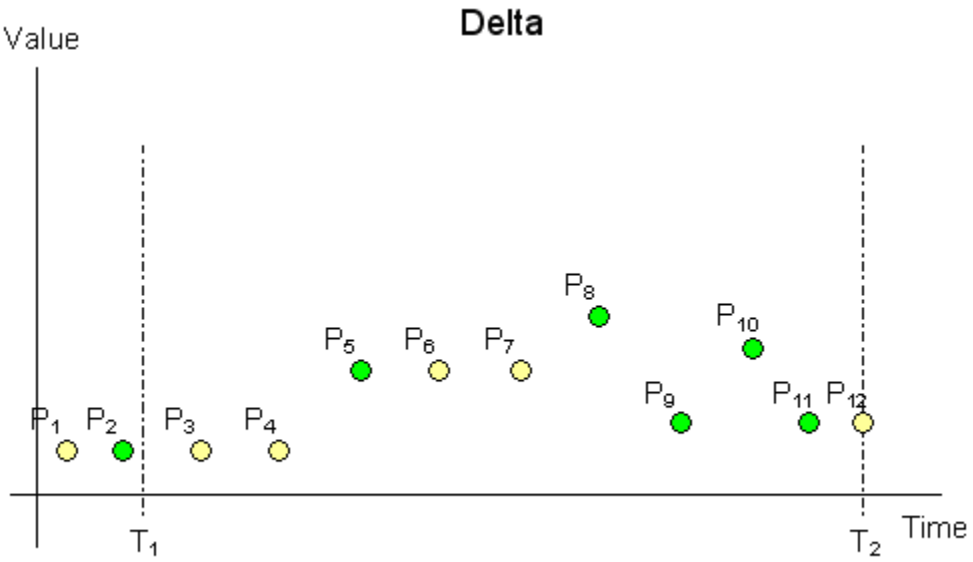
Delta retrieval, or retrieval based on exception, is the retrieval of only the changed values for a tag(s) for the given time interval. That is, duplicate values are not returned. It works with all types of tags.

Delta retrieval always produces a rowset comprised of only rows that are actually stored on the Historian; that is, a delta query returns all of the physical rows in history for the specified tags, over the specified period, minus any duplicate values. If there is no actual data point at the start time, the last data point before the start time is returned.

Delta retrieval is the default mode for discrete and string tables and from the History table.

### Delta Retrieval - How It Works

The following illustration shows how values are returned for delta retrieval:




Data is retrieved in delta mode with a start time of $T_1$ and an end time of $T_2$. Each dot in the graphic represents an actual data point stored on the Historian. From these points, the following are returned:

- $P_2$, because there is no actual data point at $T_1$
- $P_5$, $P_8$, $P_9$, $P_{10}$, and $P_{11}$, because they represent changed values during the time period

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

For delta retrieval for replicated summary tags on a tier-2 historian, if a point with doubtful quality is returned as the result of a value selection from an input summary point with a contained gap, the same point can be returned again with good quality if the same value is selected again from the next input summary point that has good quality.

### Delta Retrieval - Supported Value Parameters

You can use various parameters to adjust which values are returned in delta retrieval mode. For more information, see the following sections:

- Time Deadband (wwTimeDeadband)
- Value Deadband (wwValueDeadband)
- History Version (wwVersion)

### Delta Retrieval - Query Examples

To use the delta retrieval mode, set the following parameter in your query.

```
wwRetrievalMode = 'Delta'
```

### Both Leading and Trailing Edge Detection for Discrete Tags

If Both is specified as the parameter in the edge detection extension, all rows satisfying both the leading and trailing conditions are returned.

The following queries select values of "SysPulse" and "MyPulse" that meet an edge detection of Both for a value criterion of 1 (On) from the History and WideHistory tables between 12:59 and 1:04 a.m. on December 8, 2001.

### Delta Retrieval - Initial Values

Initial values are special values that can be returned from queries that lie exactly on the query start time, even if there is not a data point that specifically matches the specified start time. If there is not a value exactly on the query start time, the last point before the start time will be returned with its DateTime set to the query start time and its Quality set to 133. If no value exists at or prior to the query start time, a NULL value will be returned at start time with QualityDetail set to 65536, OPCQuality set to 0, and Quality set to 1.

Querying the start time in exclusive form with the > operator indicates that a value should not be returned for the query start time if one does not exist. Querying the start time in inclusive form with the >= operator indicates that an initial value should be returned.

For example, the following exclusive query statement does not return an initial value for 2009-01-01 02:00:00.

```
DateTime > '2009-01-01 02:00:00'
```

However, the following inclusive query statement does return an initial value for 2009-01-01 02:00:00.

```
DateTime >= '2009-01-01 02:00:00'
```

No special final value is returned.

### Delta Retrieval - Handling NULL Values

The initial NULL value after a non-NULL is always returned. Multiple NULL values are suppressed. The first non-NULL after a NULL is always returned even if it is the same as the previous non-NULL value.

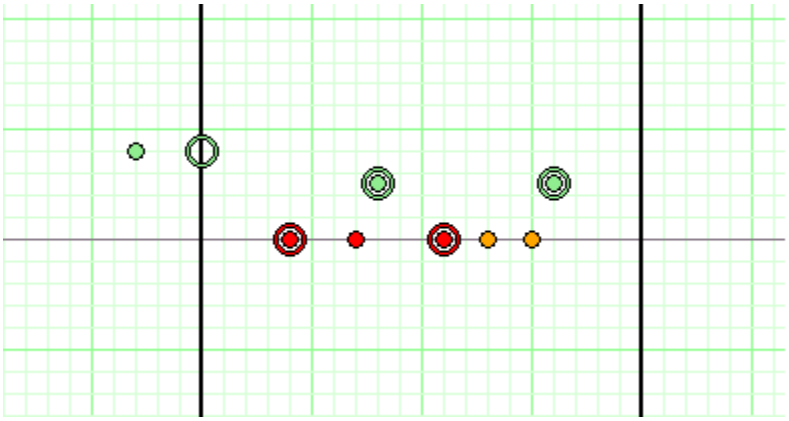
```
SELECT TagName, DateTime, Value, QualityDetail
   FROM History
      WHERE TagName = 'A001'
         AND DateTime >= '2009-09-12 00:20'
         AND DateTime <= '2009-09-12 00:40'
         AND wwRetrievalMode = 'Delta'
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

This query can be run against the following sample data:

| Tagname | DateTime | Value | QualityDetail |
|---|---|---|---|
| A001 | 2009-09-12 00:17 | 0.8 | 192 |
| A001 | 2009-09-12 00:24 | 0.0 | 249 |
| A001 | 2009-09-12 00:27 | 0.0 | 249 |
| A001 | 2009-09-12 00:28 | 0.5 | 192 |
| A001 | 2009-09-12 00:31 | 0.0 | 249 |
| A001 | 2009-09-12 00:33 | 0.0 | 24 |
| A001 | 2009-09-12 00:35 | 0.0 | 24 |
| A001 | 2009-09-12 00:36 | 0.5 | 192 |

The following is a graphical representation of the data:



The results are:

| Tagname | DateTime | Value | QualityDetail |
|---|---|---|---|
| A001 | 2009-09-12 00:20 | 0.8 | 192 |
| A001 | 2009-09-12 00:24 | NULL | 249 |
| A001 | 2009-09-12 00:28 | 0.5 | 192 |
| A001 | 2009-09-12 00:31 | NULL | 249 |
| A001 | 2009-09-12 00:36 | 0.5 | 192 |

The sample data points and the results are mapped on the following chart. Only the data falling between the time start and end marks at 00:20 and 00:40 (shown on the chart as dark vertical lines) are returned by the query.

Because there is no value that matches the start time, an initial value at 00:20 is returned in the results based on the value of the preceding data point at 00:16. Because there is no change in the value at 00:27 from the value at 00:24, the data point appears on the chart but does not appear in the results. Similarly, the two 0.0 values at 00:33 and 00:35 are also excluded from the results. However, the non-NULL value at 00:36 is returned, even

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

though it is the same as the value at 00:28, because it represents a delta from the preceding (NULL) value at 00:35.

### Full Retrieval

In full retrieval mode, all stored data points are returned, regardless of whether a value or quality has changed since the last value. This mode allows the same value and quality pair (or NULL value) to be returned consecutively with their actual timestamps. It works with all types of tags.

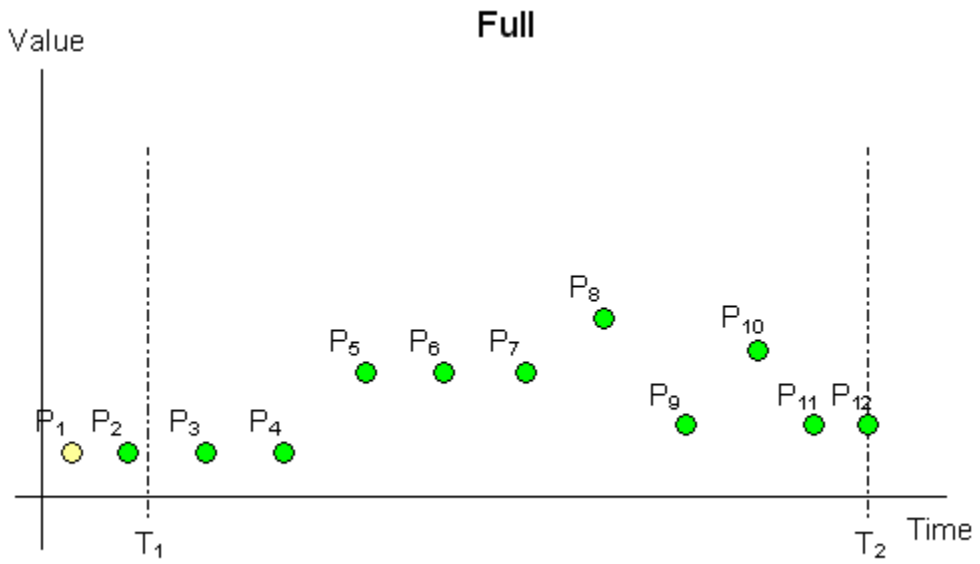
By using full retrieval in conjunction with storage without filtering (that is, no delta or cyclic storage mode is applied at the Historian), you can retrieve all values that originated from the plant floor data source or from another application.

Full retrieval best represents the process measurements recorded by the Historian. However, it creates a higher load for the server, the network and the client system because a very large number of records may be returned for longer time periods.

For full retrieval for replicated summary tags on a tier-2 historian, if a point with doubtful quality is returned as the result of a value selection from an input summary point with a contained gap, the same point can be returned again with good quality if the same value is selected again from the next input summary point that has good quality.

#### Full Retrieval - How It Works

The following illustration shows how values are returned for full retrieval:




Data is retrieved in full mode with a start time of $T_1$ and an end time of $T_2$. Each dot in the graphic represents an actual data point stored on the Historian. From these points, the following are returned:

- $P_2$, because there is no actual data point at $T_1$
- $P_3$ through $P_{12}$, because they represent stored data points during the time period

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

#### Full Retrieval - Supported Value Parameters

You can use various parameters to adjust which values are returned in full retrieval mode. For more information, see the following sections:

- History Version (wwVersion)

#### Full Retrieval - Query Examples

**Query 1**

```
SELECT DateTime, TagName, Value
   FROM History
      WHERE TagName IN ('SysTimeSec','SysTimeMin')
         AND DateTime >= '2001-12-09 11:35'
         AND DateTime <= '2001-12-09 11:36'
         AND wwRetrievalMode = 'Full'
```

#### Full Retrieval - Initial Values

Full retrieval mode handles initial values the same way as delta mode. For more information on initial values, see Delta Retrieval - Initial Values.

### Interpolated Retrieval

Interpolated retrieval works like cyclic retrieval, except that interpolated values are returned if there is no actual data point stored at the cycle boundary.

This retrieval mode is useful if you want to retrieve cyclic data for slow-changing tags. For a trend, interpolated retrieval results in a smoother curve instead of a "stair-stepped" curve. This mode is also useful if you have a slow-changing tag and a fast-changing tag and want to retrieve data for both. Finally, some advanced applications require more evenly spaced values than would be returned if interpolation was not applied.

By default, interpolated retrieval uses the interpolation setting specified for the tag in the Historian. This means that if a tag is set to use stair-step interpolation, interpolated retrieval gives the same results as cyclic retrieval.

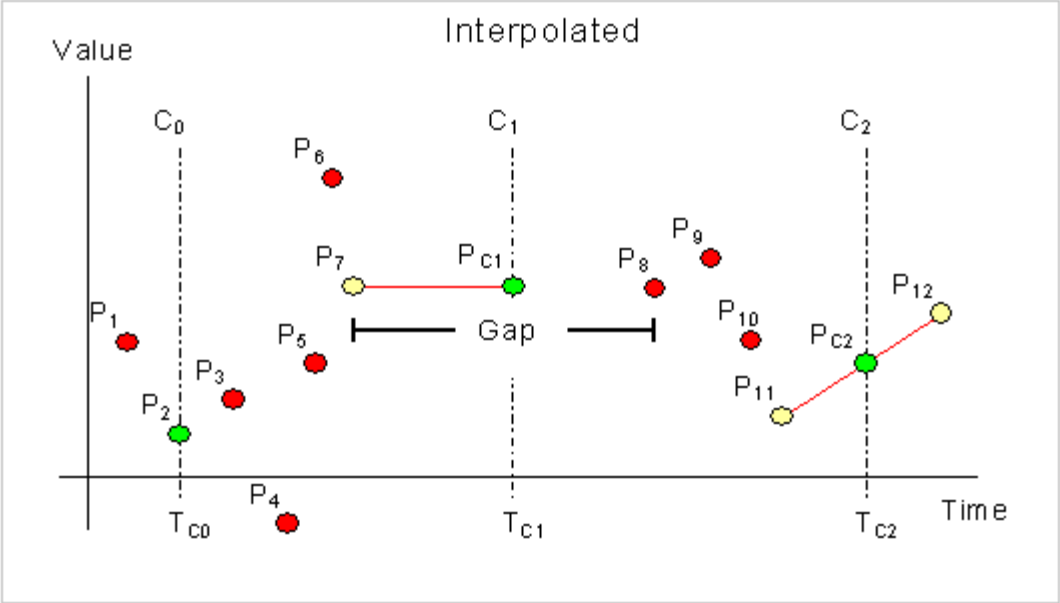
Interpolation is only applied to analog tags. If you retrieve data for other types of tags, stair-step interpolation is used, and the results are the same as for cyclic retrieval.

Interpolated retrieval is a bit slower than cyclic retrieval. It shares the limitations of cyclic retrieval in that it may not accurately represent the stored process data.

#### Interpolated Retrieval - How It Works

The following illustration shows how the values for an analog tag that is configured for linear interpolation are returned when using interpolated retrieval.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




Data is retrieved in interpolated mode with a start time of $T_{C0}$ and an end time of $T_{C2}$. The resolution has been set in such a way that the Historian returns data for three cycle boundaries at $T_{C0}$, $T_{C1}$, and $T_{C2}$. $P_1$ to $P_{12}$ represent actual data points stored on the Historian. Of these points, eleven represent normal analog values, and one, $P_7$, represents a NULL value due to an I/O Server disconnect, which causes a gap in the data between $P_7$ and $P_8$.

The green points ($P_2$, $P_{C1}$, $P_{C2}$) are returned. The yellow points ($P_7$, $P_{11}$, $P_{12}$) are used to interpolate the returned value for each cycle. The red points are considered, but not used in calculating the points to return.

Because $P_2$ is located exactly at the query start time, it is returned at that time without the need for any interpolation. At the following cycle boundary, point $P_{C1}$ is returned, which is the NULL value represented by $P_7$ shifted forward to time $T_{C1}$. At the last cycle boundary, point $P_{C2}$ is returned, which has been interpolated using points $P_{11}$ and $P_{12}$.

### Interpolated Retrieval - Supported Value Parameters

You can use various parameters to adjust which values are returned in interpolated retrieval mode. For more information, see the following sections:

- Cycle Count (X Values over Equal Time Intervals) (wwCycleCount)
- Resolution (Values Spaced Every X ms) (wwResolution)
- History Version (wwVersion)
- Interpolation Type (wwInterpolationType)
- Timestamp Rule (wwTimestampRule)
- Quality Rule (wwQualityRule)

### Interpolated Retrieval - Query Examples

To use the interpolated mode, set the following parameter in your query.

```
wwRetrievalMode = 'Interpolated'
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Interpolated Retrieval - Initial and Final Values

A value is returned at the start time and end time of the query using interpolation of the surrounding points.

### Interpolated Retrieval - Handling NULL Values

When a NULL value precedes a cycle boundary, that NULL will be returned at the cycle boundary.

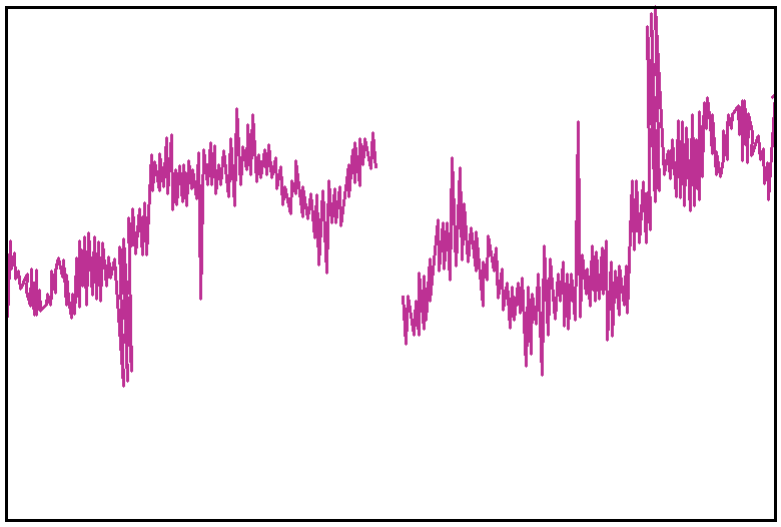
If a valid value precedes a cycle boundary, but is followed by a NULL value after the cycle boundary, no interpolation will be used and wwInterpolationType will be set to STAIRSTEP for that value.

## "Best Fit" Retrieval

For the "best fit" retrieval mode, the total time for the query is divided into even sub-periods, and then up to five values are returned for each sub-period:

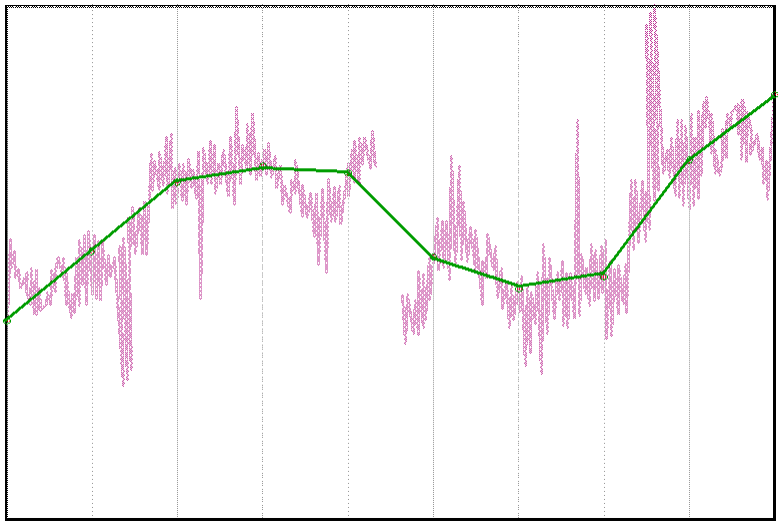
- First value in the period
- Last value in the period
- Minimum value in the period, with its actual time
- Maximum value in the period, with its actual time
- The first "exception" in the period (non-Good quality)

"Best fit" retrieval allows for a compromise between delta retrieval and cyclic retrieval. For example, delta retrieval can accurately represent a process over a long period of time, as shown in the following trend. However, to achieve this representation, a large number of data values must be returned.

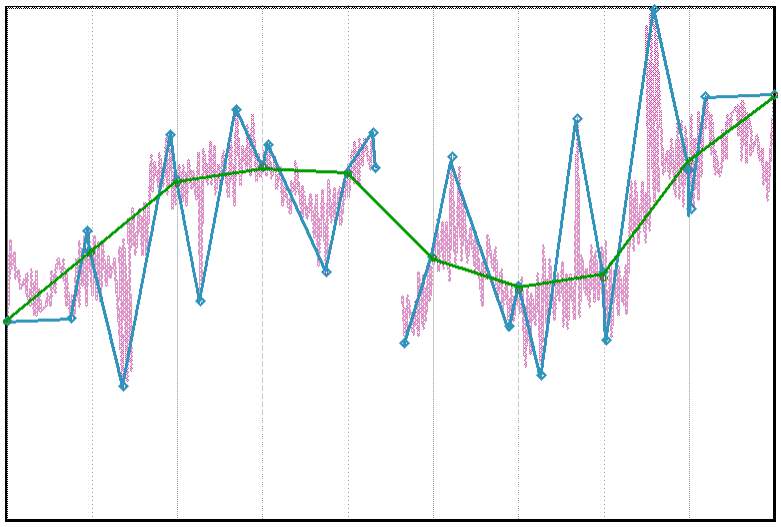


If cyclic retrieval is used to retrieve the data, the retrieval is much more efficient, because fewer values are returned. However, the representation is not as accurate, as the following trend shows.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.



"Best fit" retrieval allows for faster retrieval, as typically achieved by using cyclic retrieval, plus the better representation typically achieved by using delta retrieval. This is shown in the following trend.



For example, for one week of five-second data, 120,960 values would be returned for delta retrieval, versus around 300 values for best-fit retrieval.

Best-fit retrieval uses retrieval cycles, but it is not a true cyclic mode. Apart from the initial value, it only returns actual delta points. For example, if one point is both the first value and the minimum value in a cycle, it is returned only one time. In a cycle where a tag has no points, nothing is returned.

As in cyclic retrieval, the number of cycles is based on the specified resolution or cycle count. However, the number of values returned is likely to be more than one per cycle.

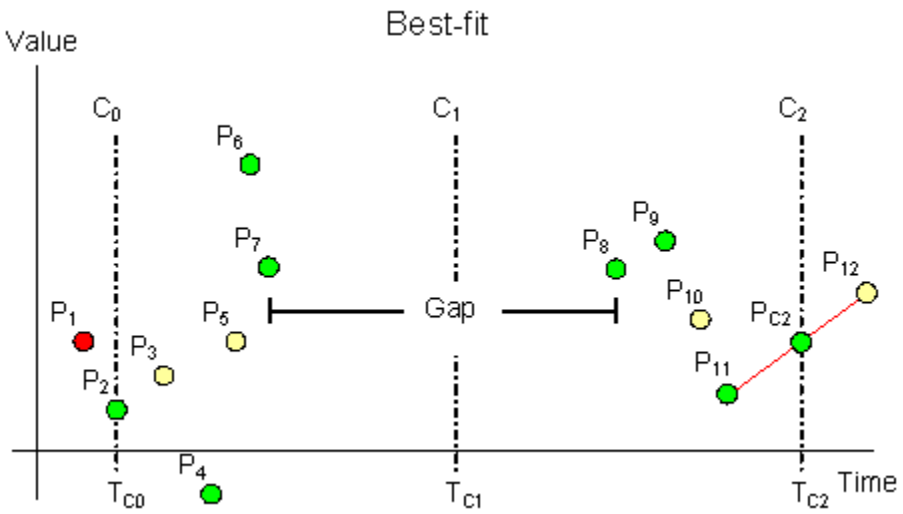
All points are returned in chronological order. If multiple points are to be returned for a particular timestamp, then those points are returned in the order in which the corresponding tags were specified in the query.

The best-fit algorithm is only applied to analog and analog summary tags. For all other tags, delta results are returned.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Best Fit Retrieval - How It Works

The following illustration shows how the best-fit algorithm selects points for an analog tag.




Data is retrieved in best-fit mode with a start time of $T_{C0}$ and an end time of $T_{C2}$. The resolution has been set in such a way that the Historian returns data for two complete cycles starting at $T_{C0}$ and $T_{C1}$ and an incomplete cycle starting at $T_{C2}$. $P_1$ to $P_{12}$ represent actual data points stored on the Historian. Of these points, eleven represent normal analog values, and one, $P_7$, represents a NULL value due to an I/O Server disconnect, which causes a gap in the data between $P_7$ and $P_8$.

Because $P_2$ is located exactly at the start time, no initial value needs to be interpolated at the start time. Therefore, point $P_1$ is not considered at all. All other points are considered, but only the points indicated by green markers on the graph are returned.

From the first cycle, four points are returned:

- $P_2$ as the initial value of the query, as well as the first value in the cycle
- $P_4$ as the minimum value in the cycle
- $P_6$ as both the maximum value and the last value in the cycle
- $P_7$ as the first (and only) occurring exception in the cycle

From the second cycle, three points are returned:

- $P_8$ as the first value in the cycle
- $P_9$ as the maximum value in the cycle
- $P_{11}$ as both the minimum value and the last value in the cycle
- As no exception occurs in the second cycle, none is returned.

Because the tag does not have a point exactly at the query end time, where an incomplete third cycle starts, the end value $P_{C2}$ is interpolated between $P_{11}$ and $P_{12}$, assuming that linear interpolation is used.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

#### Best Fit Retrieval - Supported Value Parameters

You can use various parameters to adjust which values are returned in best-fit retrieval mode. For more information, see the following sections:

- Cycle Count (X Values over Equal Time Intervals) (wwCycleCount)
- Resolution (Values Spaced Every X ms) (wwResolution)
- History Version (wwVersion)
- Interpolation Type (wwInterpolationType)
- Quality Rule (wwQualityRule)

#### Best Fit Retrieval - Query Examples

To use the best fit retrieval mode, set the following parameter in your query.

```
wwRetrievalMode = 'BestFit'
```

#### Best Fit Retrieval - Initial and Final Values

A point will be returned at the query start time and the query end time for each tag queried, if a point exists for that tag at or after the end time of the query. The values of the initial and final points will be determined by interpolating the points preceeding and following the query start or query end time.

Standard interpolation rules will be used to return the initial and final values. For more information, see Interpolated Retrieval.

#### Best Fit Retrieval - Handling NULL Values

When any of the four good points are returned from a cycle that contains gaps or from an incomplete cycle with the query end time located inside of the calculation cycle the quality detail of each of the non-null points returned is modified to alert the user to this fact. This is done by performing a logical OR operation of the value 4096, which means partial cycle, onto the existing quality detail. (This is the delta point equivalent to the use of PercentGood for cyclic.)

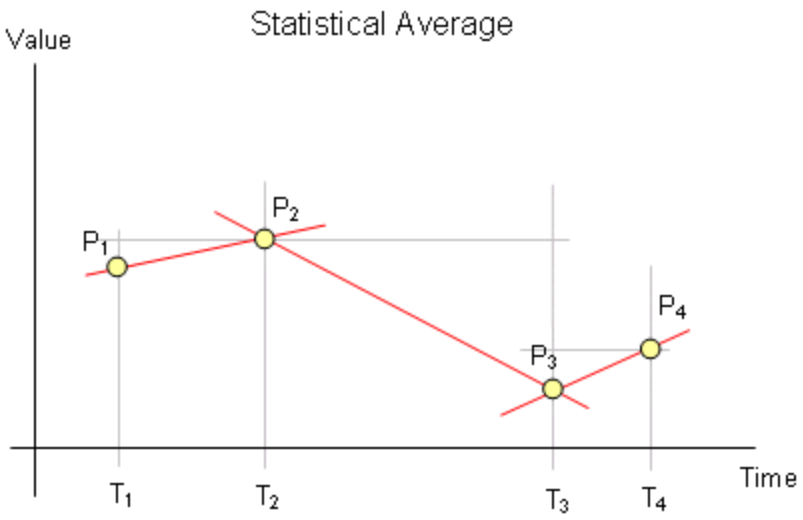
### Average Retrieval

For the time-weighted average (in short: "average") retrieval mode, a time-weighted average algorithm is used to calculate the value to be returned for each retrieval cycle.

For a statistical average, the actual data values are used to calculate the average. The average is the sum of the data values divided by the number of data values. For the following data values, the statistical average is computed as:

$(P_1 + P_2 + P_3 + P_4) / 4) = \text{Average}$

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

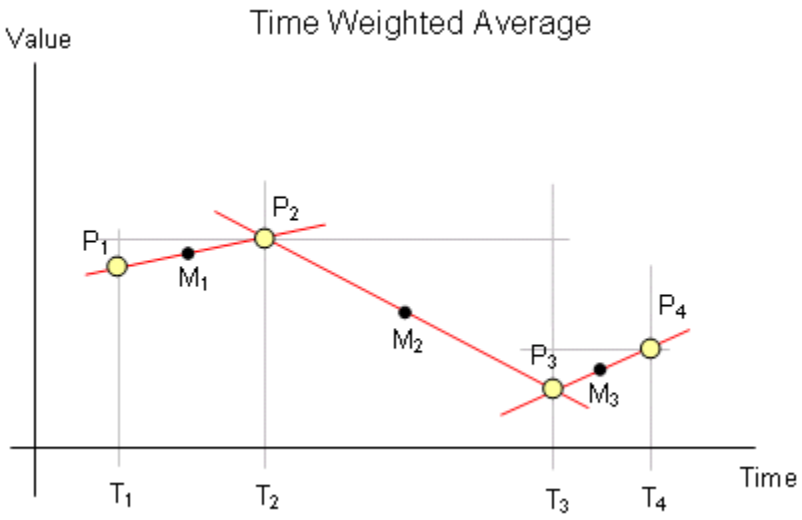



For a time-weighted average, values are multiplied by the time difference between the points to determine the time-weighted value. Therefore, the longer a tag had a particular value, the more weight that value holds in the overall average. The overall average is determined by adding all of the time-weighted values and then dividing that number by the total amount of time.

Which values are weighted depends on the interpolation setting of the tag. For a tag that uses linear interpolation, the midpoints between values are weighted. For a tag that uses stair-step interpolation, the earlier of two values is weighted.

For the following data values of a tag that uses linear interpolation, the time-weighted average is computed as:

$(((P_1 + P_2) / 2) \times (T_2 - T_1)) + (((P_2 + P_3) / 2) \times (T_3 - T_2)) + (((P_3 + P_4) / 2) \times (T_4 - T_3)) / (T_4 - T_1) = \text{Average}$




If the same tag uses stair-step interpolation, the time-weighted average is:

$((P_1 \times (T_2 - T_1)) + (P_2 \times (T_3 - T_2)) + (P_3 \times (T_4 - T_3))) / (T_4 - T_1) = \text{Average}$

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

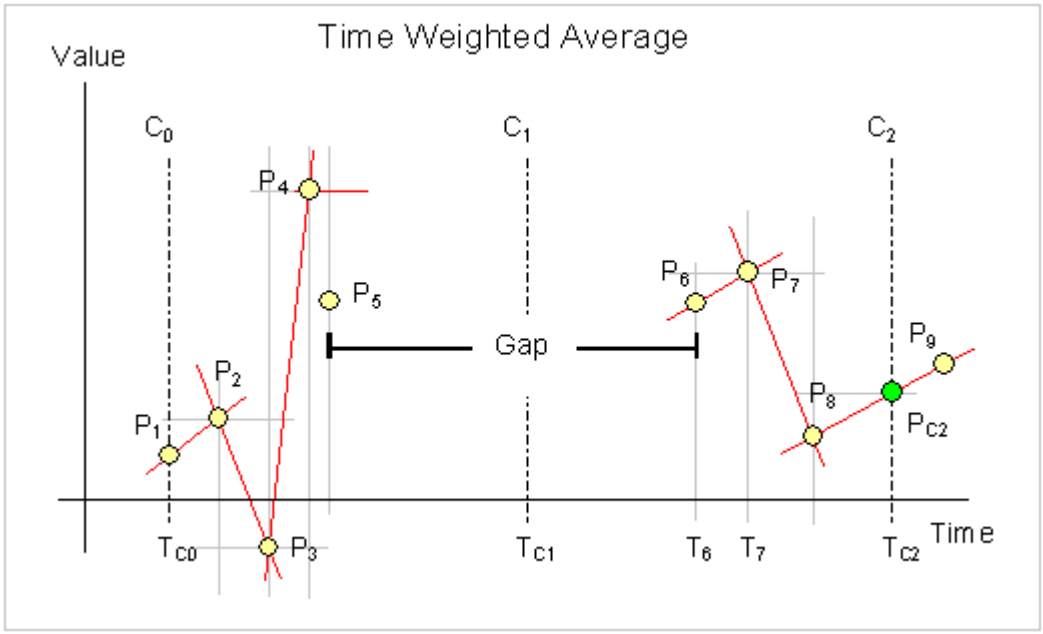
The SQL Server AVG aggregate is a simple statistical average. Using the average retrieval mode with a cycle count of 1 returns data much faster than the AVG aggregate, and usually more accurately due to the time weighting. The event subsystem also returns a simple statistical average.

Average retrieval returns one row for each tag in the query for each cycle. The number of cycles is based on the specified resolution or cycle count.

The time-weighted average algorithm is only applied to analog and analog summary tags. If you use average retrieval with other tags, the results are the same as when using regular cyclic retrieval.

### Average Retrieval - How It Works

The following illustration shows how the time-weighted average is calculated for an analog tag that uses linear interpolation.




Data is retrieved in average mode with a start time of $T_{C0}$ and an end time of $T_{C2}$. The resolution has been set in such a way that the Historian returns data for two complete cycles starting at $T_{C0}$ and $T_{C1}$ and an incomplete cycle starting at $T_{C2}$. $P_1$ to $P_9$ represent actual data points stored on the Historian. Of these points, eight represent normal analog values, and one, $P_5$, represents a NULL due to an I/O Server disconnect, which causes a gap in the data between $P_5$ and $P_6$. Assume that the query calls for timestamping at the end of the cycle.

Results are calculated as follows:

- The "initial value" returned at the query start time ($T_{C0}$) is the time-weighted average of the points in the last cycle preceding $T_{C0}$.
- The value returned at $T_{C1}$ is the time-weighted average of the points in the cycle starting at $T_{C0}$.
- The value returned at the query end time ($T_{C2}$) is the time-weighted average of the points in the cycle starting at $T_{C1}$.

To understand how the time-weighted average is calculated, observe the last cycle as an example. First, the area under the curve must be calculated. This curve is indicated by the red line through $P_6$, $P_7$, $P_8$ and $P_{C2}$, where $P_{C2}$ represents the interpolated value at time $T_{C2}$ using points $P_8$ and $P_9$. The data gap caused by the I/O Server

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

disconnect does not contribute anything to this area. If a quality rule of "good" has been specified, then points with doubtful quality will not contribute anything to the area, either.

To understand how the area is calculated, consider points $P_6$ and $P_7$. The area contribution between these two points is calculated by multiplying the arithmetic average of value $P_6$ and value $P_7$ by the time difference between the two points. The formula is:

$((P_6 + P_7) / 2) \times (T_7 - T_6)$

When the area for the whole cycle has been calculated, the time-weighted average is calculated by dividing that area by the cycle time, less any periods within the cycle that did not contribute anything to the area calculation. The result is returned at the cycle end time.

If you take a closer look at points $P_4$ and $P_5$ in the example, you can see that the red line through point $P_4$ is parallel to the x-axis. This is because $P_5$ represents a NULL, which cannot be used to calculate an arithmetic average. Instead, the value $P_4$ is used for the whole time period between points $P_4$ and $P_5$.

The area calculation is signed. If the arithmetic average between two points is negative, then the contribution to the area is negative.

#### Average Retrieval - Supported Value Parameters

You can use various parameters to adjust which values are returned in average retrieval mode. For more information, see the following sections:

- Cycle Count (X Values over Equal Time Intervals) (wwCycleCount)
- Resolution (Values Spaced Every X ms) (wwResolution)
- History Version (wwVersion)
- Interpolation Type (wwInterpolationType)
- Timestamp Rule (wwTimestampRule)
- Quality Rule (wwQualityRule)

#### Average Retrieval - Query Examples

To use the average mode, set the following parameter in your query.

```
wwRetrievalMode = 'Average'
```

### Query 1

The time-weighted average is computed for each of five 1-minute long cycles.

Note that the wwTimeStampRule parameter is set to "Start" in the query. This means that the value stamped at 11:18:00.000 represents the average for the interval 11:18 to 11:19, the value stamped at 11:19:00.000 represents the average for the interval 11:19 to 11:20, and so on. If no timestamp rule is specified in the query, then the default setting in the TimeStampRule system parameter is used.

In the first cycle there are no points, so a NULL is returned. In the second cycle value points are found covering 77.72 percent of the time as returned in PercentGood. This means that the returned average is calculated based on 77.72 percent of the cycle time. Because the same OPCQuality is not found for all the points in the cycle, OPCQuality is set to Doubtful. In the remaining three cycles, only good points occur, all with an OPCQuality of 192.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

Because no quality rule is specified in the query using the wwQualityRule parameter, the query uses the default as specified by the QualityRule system parameter. If a quality rule of Extended is specified, any point stored with doubtful OPCQuality will be used to calculate the average, and the point time will therefore be included in the calculation of PercentGood.

```
SELECT DateTime, TagName, CONVERT(DECIMAL(10, 2), Value) AS Value, OPCQuality, PercentGood
FROM History
   WHERE TagName = 'ReactTemp'
      AND DateTime >= '2005-04-11 11:18:00'
      AND DateTime <  '2005-04-11 11:23:00'
      AND wwRetrievalMode = 'Average'
      AND wwCycleCount = 5
      AND wwTimeStampRule = 'Start'
```

The results are:

```
              DateTime          TagName       Value      OPCQuality     PercentGood

(cycle 1)     2005-04-11        ReactTemp     NULL       0              0.0
              11:18:00.000

(cycle 2)     2005-04-11        ReactTemp     70.00      64             77.72
              11:19:00.000

(cycle 3)     2005-04-11        ReactTemp     153.99     192            100.0
              11:20:00.000

(cycle 4)     2005-04-11        ReactTemp     34.31      192            100.0
              11:21:00.000

(cycle 5)     2005-04-11        ReactTemp     134.75     192            100.0
              11:22:00.000
```

### Query 2

This query demonstrates the use of the average retrieval mode in a wide query. Time-weighted average values are returned for the analog tags ReactTemp and ReactLevel, while regular cyclic points are returned for the discrete tag, WaterValve.

```
SELECT * FROM OpenQuery(INSQL,
   'SELECT DateTime, ReactTemp, ReactLevel, WaterValve FROM WideHistory
      WHERE DateTime >= "2004-06-07 08:00"
         AND DateTime < "2004-06-07 08:05"
         AND wwRetrievalMode = "Average"
         AND wwCycleCount = 5
   ')
```

The results are:

```
DateTime                   ReactTemp     ReactLevel     WaterValve

2004-06-07 08:00:00.000    47.71621      1676.69716     1

2004-06-07 08:01:00.000    157.28076     1370.88097     0

2004-06-07 08:02:00.000    41.33734      797.67296      1

2004-06-07 08:03:00.000    122.99525     1921.66771     0
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

```
DateTime                    ReactTemp     ReactLevel     WaterValve
2004-06-07 08:04:00.000     105.28866     606.40488      1
```

### Average Retrieval - Initial and Final Values

If wwTimeStampRule = END, the initial value is calculated by performing an average calculation on the cycle leading up to the query start time. No special handling is done for the final value.

If wwTimeStampRule = START, the final value is calculated by performing an average calculation on the cycle following the query end time. No special handling is done for the initial value.

### Average Retrieval - Handling NULL Values

Gaps introduced by NULL values are not included in the average calculations. The average only considers the time ranges with good values. TimeGood indicates the total time per cycle that the tags value was good.

## Minimum Retrieval

The minimum value retrieval mode returns the minimum value from the actual data values within a retrieval cycle. If there are no actual data points stored on the Historian for a given cycle, nothing is returned. NULL is returned if the cycle contains one or more NULL values.

As in cyclic retrieval, the number of cycles is based on the specified resolution or cycle count. However, minimum retrieval is not a true cyclic mode. Apart from the initial value, all points returned are delta points.

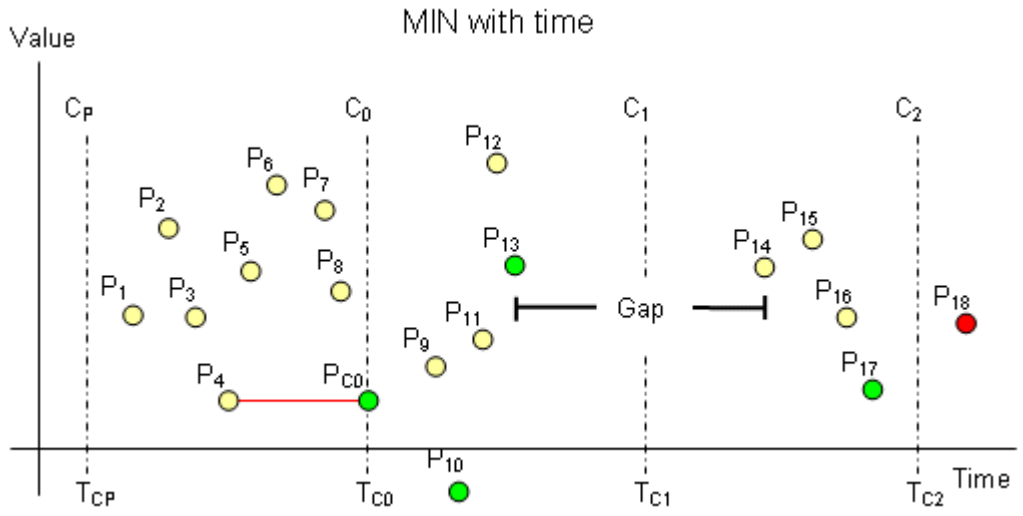
Minimum retrieval only works with analog tags. For all other tags, normal delta results are returned.

All returned values are in chronological order. If multiple points are to be returned for a particular timestamp, they are returned in the order in which the tags were specified in the query. If the minimum value occurs several times in a cycle, the minimum value with the earliest timestamp is returned.

Using the minimum retrieval mode with a cycle count of 1 returns the same results as the SQL Server MIN aggregate; however, the data is returned much faster.

### Minimum Retrieval - How It Works

The following illustration shows how the minimum value is selected for an analog tag.




© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

This example has a start time of $T_{C0}$ and an end time of $T_{C2}$. The resolution has been set in such a way that the Historian returns data for two complete cycles starting at $T_{C0}$ and $T_{C1}$, a "phantom" cycle starting at $T_{CP}$, and an incomplete cycle starting at $T_{C2}$. The phantom cycle has the same duration as the first cycle in the query period, extending back in time from the query start time.

For the queried tag, a total of 18 points are found throughout the cycles, represented by the markers $P_1$ through $P_{18}$. Of these points, 17 represent normal analog values. The point $P_{13}$ represents a NULL due to an I/O Server disconnect, which causes a gap in the data between $P_{13}$ and $P_{14}$.

The minimum value for the "phantom" cycle starting at $T_{CP}$ is returned as the initial value at $T_{C0}$. Point $P_{18}$ is not considered at all because it is outside of the query time frame. All other points are considered, but only the points indicated by green markers on the graph are returned ($P_{10}$, $P_{13}$, and $P_{17}$).

In total, four points are returned:

- $P_4$ as the minimum value of the "phantom" cycle and the initial point
- $P_{10}$ as the minimum value in the first cycle
- $P_{13}$ as the first and only exception occurring in the first cycle
- $P_{17}$ as the minimum value in the second cycle

No points are returned for the incomplete third cycle starting at the query end time, because the tag does not have a point exactly at that time.

If the minimum value of the first cycle is located exactly at the query start time, both this value and the minimum value of the phantom cycle are returned.

#### Minimum Retrieval - Supported Value Parameters

You can use various parameters to adjust which values are returned in minimum retrieval mode. For more information, see the following sections:

- Cycle Count (X Values over Equal Time Intervals) (wwCycleCount)
- Resolution (Values Spaced Every X ms) (wwResolution)
- History Version (wwVersion)
- Quality Rule (wwQualityRule)

#### Minimum Retrieval - Query Examples

To use the minimum mode, set the following parameter in your query:

```
wwRetrievalMode = 'Min'
```

or

```
wwRetrievalMode = 'Minimum'
```

#### Minimum Retrieval - Initial and Final Values

For analog tags, the minimum value of the tag in the cycle leading up to the query start time is returned with its timestamp changed to the query start time. If there is no point exactly at the "phantom" cycle start time, the point leading up to the phantom cycle is also considered for the minimum calculation.(No adjustments are made to the quality of the initial point even though the timestamp may have been altered.) Apart from the initial

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

value, all points returned are delta points. (For more information on initial values, see Delta Retrieval - Initial Values.)

If a point occurs exactly on the query end time, that point will be returned with the partial cycle bit, 4096, set in quality detail. If there is more than one such point, only the first point will be returned.

### Minimum Retrieval - Handling NULL Values and Incomplete Cycles

The first NULL value in a cycle is returned.

When a minimum value is returned from a cycle that contains gaps (including a gap extended from the previous cycle) or from an incomplete cycle with the query end time located inside of the calculation cycle, the point's quality detail is modified to flag this. This is done by performing a logical OR operation of the value 4096, which indicates a partial cycle, onto the existing quality detail.

As an example of how minimum retrieval mode handles NULLs, consider the following query:

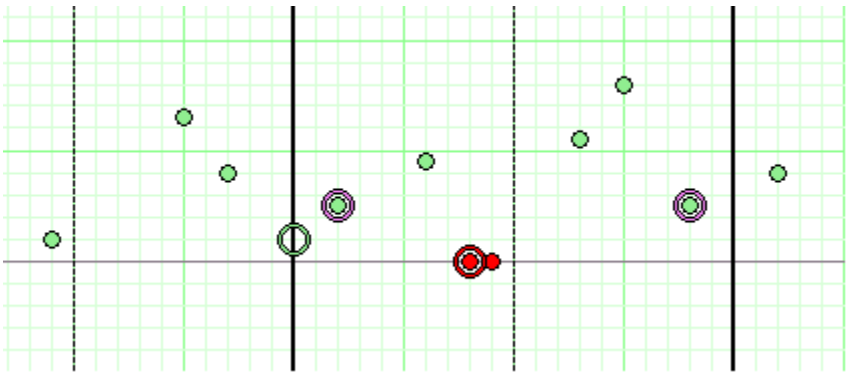
```
SELECT TagName, DateTime, Value, QualityDetail
   FROM History
      WHERE TagName = 'A001'
         AND DateTime >= '2009-09-12 00:20'
         AND DateTime <= '2009-09-12 00:40'
         AND wwResolution = 10000
         AND wwRetrievalMode = 'Minimum'
```

This query can be run against the following sample data:

| Tagname | DateTime | Value | QualityDetail |
|---|---|---|---|
| A001 | 2009-09-12 00:09 | 0.2 | 192 |
| A001 | 2009-09-12 00:15 | 1.3 | 192 |
| A001 | 2009-09-12 00:17 | 0.8 | 192 |
| A001 | 2009-09-12 00:22 | 0.5 | 192 |
| A001 | 2009-09-12 00:26 | 0.9 | 192 |
| A001 | 2009-09-12 00:28 | 0.0 | 249 |
| A001 | 2009-09-12 00:29 | 0.0 | 249 |
| A001 | 2009-09-12 00:33 | 1.1 | 192 |
| A001 | 2009-09-12 00:35 | 1.6 | 192 |
| A001 | 2009-09-12 00:38 | 0.5 | 192 |
| A001 | 2009-09-12 00:42 | 0.8 | 192 |

The following is a graphical representation of the data:

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.



The results are:

| Tagname | DateTime | Value | QualityDetail |
|---|---|---|---|
| A001 | 2009-09-12 00:20 | 0.2 | 192 |
| A001 | 2009-09-12 00:22 | 0.5 | 4288 |
| A001 | 2009-09-12 00:28 | NULL | 249 |
| A001 | 2009-09-12 00:38 | 0.5 | 4288 |

The sample data points and the results are mapped on the following chart. Only the data falling between the time start and end marks at 00:20 and 00:40 (shown on the chart as dark vertical lines) are returned by the query. The resolution is set at 10,000 milliseconds.

Because there is no value that matches the start time, an initial value at 00:20 is returned based on the minimum value of the preceding cycle, which is the data point at 00:09. In the two subsequent cycles, the minimum values are at 00:22 and 00:38. The quality for these two values is set to 4288 (4096 + 192). The remaining data points are excluded because they are not minimums. In addition, the first NULL at 00:28 is included, but the second NULL (at 00:29) is not.

## Maximum Retrieval

The maximum value retrieval mode returns the maximum value from the actual data values within a retrieval cycle. If there are no actual data points stored on the Historian for a given cycle, nothing is returned. NULL is returned if the cycle contains one or more NULL values.

As in cyclic retrieval, the number of cycles is based on the specified resolution or cycle count. However, maximum retrieval is not a true cyclic mode. Apart from the initial value, all points returned are delta points.

Maximum retrieval only works with analog tags. For all other tags, normal delta results are returned.

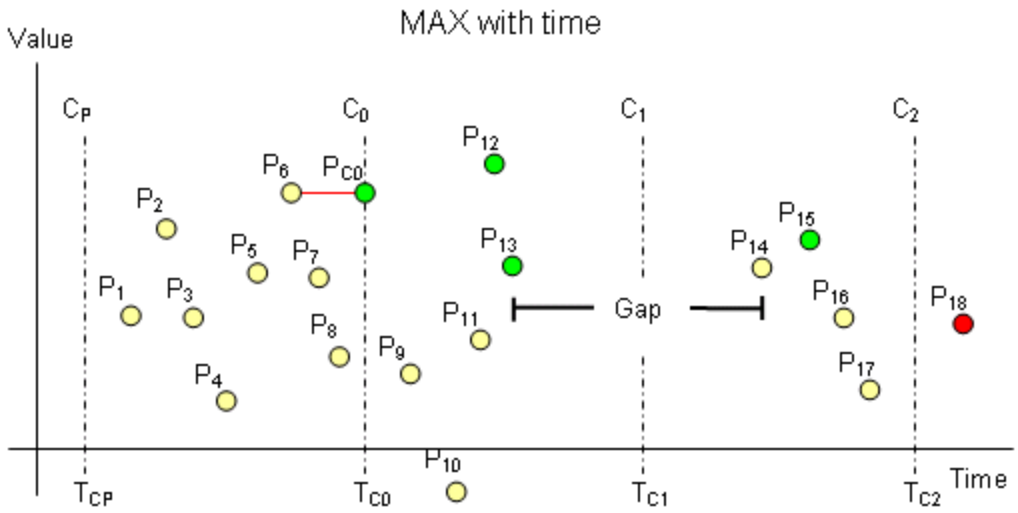
All returned values are in chronological order. If multiple points are to be returned for a particular timestamp, they are returned in the order in which the tags were specified in the query. If the maximum value occurs several times in a cycle, the maximum value with the earliest timestamp is returned.

Using the maximum retrieval mode with a cycle count of 1 returns the same results as the SQL Server MAX aggregate; however, the data is returned much faster.

### Maximum Retrieval - How It Works

The following illustration shows how the maximum value is selected for an analog tag.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




This example has a start time of $T_{C0}$ and an end time of $T_{C2}$. The resolution has been set in such a way that the Historian returns data for two complete cycles starting at $T_{C0}$ and $T_{C1}$, a "phantom" cycle starting at $T_{CP}$, and an incomplete cycle starting at $T_{C2}$. The phantom cycle has the same duration as the first cycle in the query period, extending back in time from the query start time.

For the queried tag, a total of 18 points are found throughout the cycles, represented by the markers $P_1$ through $P_{18}$. Of these points, 17 represent normal analog values. The point $P_{13}$ represents a NULL due to an I/O Server disconnect, which causes a gap in the data between $P_{13}$ and $P_{14}$.

The maximum value for the "phantom" cycle starting at $T_{CP}$ is returned as the initial value at $T_{C0}$. Point $P_{18}$ is not considered at all because it is outside of the query time frame. All other points are considered, but only the points indicated by green markers on the graph are returned ($P_{12}$, $P_{13}$, and $P_{15}$).

In total, four points are returned:

- $P_6$ as the maximum value of the "phantom" cycle and the initial point
- $P_{12}$ as the maximum value in the first cycle
- $P_{13}$ as the first and only exception occurring in the first cycle
- $P_{15}$ as the maximum value in the second cycle

No points are returned for the incomplete third cycle starting at the query end time, because the tag does not have a point exactly at that time.

If the maximum value of the first cycle is located exactly at the query start time, this value and the maximum value of the phantom cycle are returned.

### Maximum Retrieval - Supported Value Parameters

You can use various parameters to adjust which values are returned in maximum retrieval mode. For more information, see the following sections:

- Cycle Count (X Values over Equal Time Intervals) (wwCycleCount)
- Resolution (Values Spaced Every X ms) (wwResolution)
- History Version (wwVersion)

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- Quality Rule (wwQualityRule)

### Maximum Retrieval - Query Examples

To use the maximum mode, set the following parameter in your query:

```
wwRetrievalMode = 'Max'
```

or

```
wwRetrievalMode = 'Maximum'
```

### Maximum Retrieval - Initial and Final Values

For analog tags, the maximum value of the tag in the cycle leading up to the query start time is returned with its timestamp changed to the query start time. If there is no point exactly at the phantom cycle start time, the point leading up to the phantom cycle is also considered for the maximum calculation. No adjustments are made to the quality of the initial point even though the timestamp may have been altered. Apart from the initial value, all points returned are delta points.

If a point occurs exactly on the query end time, that point is returned with the partial cycle bit, 4096, set in quality detail. If there is more than one such point, only the first point is returned.

### Maximum Retrieval - Handling NULL Values and Incomplete Cycles

The first NULL value in a cycle is returned.

When a maximum value is returned from a cycle that contains gaps (including a gap extended from the previous cycle) or from an incomplete cycle with the query end time located inside of the calculation cycle, the point's quality detail is modified to flag this. This is done by performing a logical OR operation of the value 4096, which indicates a partial cycle, onto the existing quality detail.

As an example of how maximum retrieval mode handles NULLs, consider the following query:

```
SELECT TagName, DateTime, Value, QualityDetail
   FROM History
      WHERE TagName = 'A001'
         AND DateTime >= '2009-09-12 00:20'
         AND DateTime <= '2009-09-12 00:40'
         AND wwResolution = 10000
         AND wwRetrievalMode = 'Maximum'
```

If you run this query against the following sample data:

| Tagname | DateTime | Value | QualityDetail |
|---|---|---|---|
| A001 | 2009-09-12 00:09 | 0.2 | 192 |
| A001 | 2009-09-12 00:15 | 1.3 | 192 |
| A001 | 2009-09-12 00:17 | 0.8 | 192 |
| A001 | 2009-09-12 00:22 | 0.5 | 192 |
| A001 | 2009-09-12 00:26 | 0.9 | 192 |
| A001 | 2009-09-12 00:28 | 0.0 | 249 |
| A001 | 2009-09-12 00:29 | 0.0 | 249 |
| A001 | 2009-09-12 00:33 | 1.1 | 192 |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

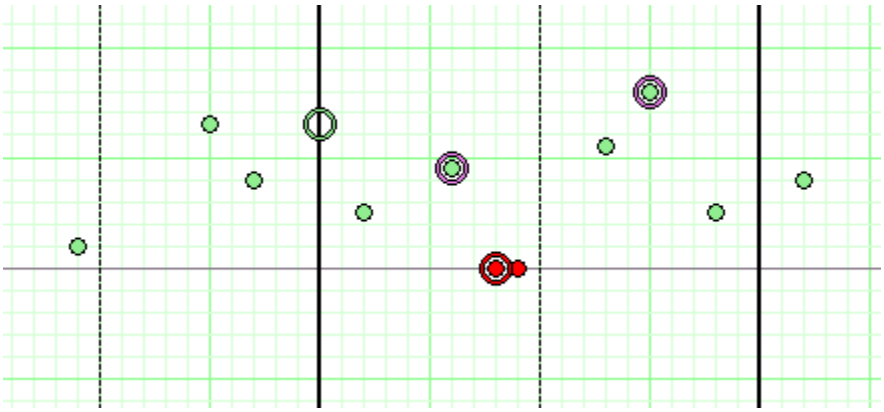
| Tagname | DateTime | Value | QualityDetail |
|---|---|---|---|
| A001 | 2009-09-12 00:35 | 1.6 | 192 |
| A001 | 2009-09-12 00:38 | 0.5 | 192 |
| A001 | 2009-09-12 00:42 | 0.8 | 192 |

The results are:

| Tagname | DateTime | Value | QualityDetail |
|---|---|---|---|
| A001 | 2009-09-12 00:20 | 1.3 | 192 |
| A001 | 2009-09-12 00:26 | 0.9 | 4288 |
| A001 | 2009-09-12 00:28 | NULL | 249 |
| A001 | 2009-09-12 00:35 | 1.6 | 4288 |

The sample data points and the results are mapped on the following chart. Only the data falling between the time start and end marks at 00:20 and 00:40 (shown on the chart as dark vertical lines) are returned by the query. The resolution is set at 10,000 milliseconds.

Because there is no value that matches the start time, an initial value at 00:20 is returned based on the maximum value of the preceding cycle, which is the data point at 00:15. In the two subsequent cycles, the maximum values are at 00:26 and 00:35. The quality for these two values is set to 4288 (4096 + 192). The remaining data points are excluded because they are not maximums. In addition, the first NULL at 00:28 is included, but the second NULL (at 00:29) is not.



## Integral Retrieval

Integral retrieval calculates the values at retrieval cycle boundaries by integrating the graph described by the points stored for the tag. Therefore, it works much like average retrieval, but it additionally applies a scaling factor. This retrieval mode is useful for calculating volume for a particular tag. For example, if one of your tags represents product flow in gallons per second, integral retrieval allows you to retrieve the total product flow in gallons during a certain time period.

Integral retrieval is a true cyclic mode. It returns one row for each tag in the query for each cycle. The number of cycles is based on the specified resolution or cycle count.

Integral retrieval only works with analog tags. For all other tags, normal cyclic results are returned.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

#### Integral Retrieval - How It Works

Calculating values for a cycle in integral retrieval is a two-step process:

- First, the Historian calculates the area under the graph created by the data points. This works the same as in average retrieval. For more information, see Average Retrieval.
- After this area has been found, it is scaled using the value of the IntegralDivisor column in the EngineeringUnit table. This divisor expresses the conversion factor from the actual rate to one of units per second.

For example, if the time-weighted average for a tag during a 1-minute cycle is 3.5 liters per second, integral retrieval returns a value of 210 for that cycle (3.5 liters per second multiplied by 60 seconds).

#### Integral Retrieval - Supported Value Parameters

You can use various parameters to adjust which values are returned in integral retrieval mode. For more information, see the following sections:

- Cycle Count (X Values over Equal Time Intervals) (wwCycleCount)
- Resolution (Values Spaced Every X ms) (wwResolution)
- History Version (wwVersion)
- Interpolation Type (wwInterpolationType)
- Timestamp Rule (wwTimestampRule)
- Quality Rule (wwQualityRule)

#### Integral Retrieval - Query Examples

To use the integral retrieval mode, set the following parameter in your query.

```
wwRetrievalMode = 'Integral'
```

#### Integral Retrieval - Initial and Final Values

If wwTimeStampRule = END, the initial value is calculated by performing an integral calculation on the cycle leading up to the query start time. No special handling is done for the final value.

If wwTimeStampRule = START, the final value is calculated by performing an integral calculation on the cycle following the query end time. No special handling is done for the initial value.

#### Integral Retrieval - Handling NULL Values

Gaps introduced by NULL values are not included in the integral calculations. The average only considers the time ranges with good values. TimeGood indicates the total time per cycle that the tags value was good.

### Slope Retrieval

Slope retrieval returns the slope of a line drawn through a given point and the point immediately before it, thus expressing the rate at which values change.

This retrieval mode is useful for detecting if a tag is changing at too great a rate. For example, you might have a temperature that should steadily rise and fall by a small amount, and a sharp increase or decrease could point to a potential problem.

The slope retrieval mode can be considered a delta mode. Apart from the initial value and a value at the query end time, all returned points are calculated delta points returned with the timestamp of an actual delta point.

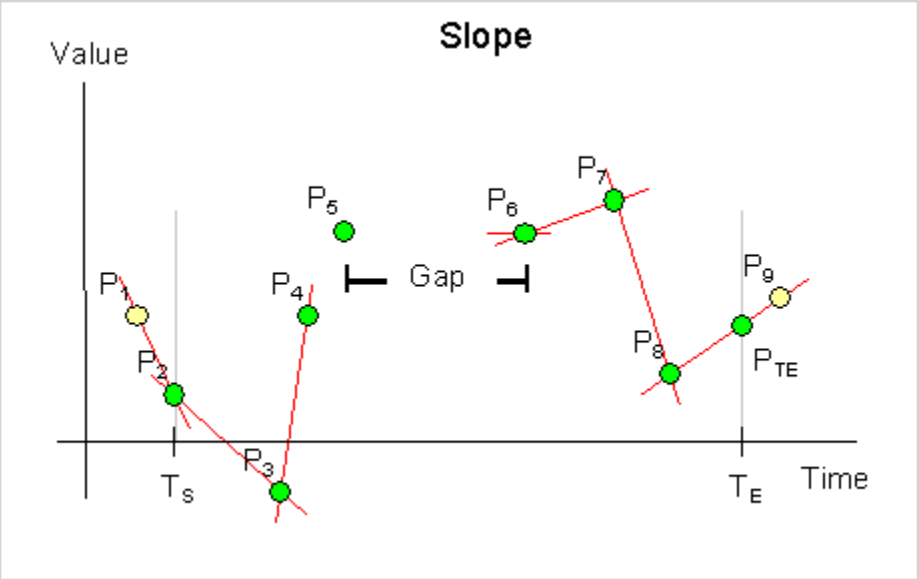
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

Slope retrieval only works with analog tags. For all other tags, normal delta results are returned.

All returned values are in chronological order. If multiple points are to be returned for a particular timestamp, they are returned in the order in which the tags were specified in the query.

### Slope Retrieval - How It Works

The following illustration shows how the slope is calculated for an analog tag.




This example has a start time of $T_S$ and an end time of $T_E$.

For the queried tag, a total of nine points are found, represented by the markers $P_1$ through $P_9$. Of these points, eight represent normal analog values. The point $P_5$ represents a NULL due to an I/O Server disconnect, which causes a gap in the data between $P_5$ and $P_6$.

For every point in the time period, slope retrieval returns the slope of the line going through that point and the point immediately before it. For two points $P_1$ and $P_2$ occurring at times $T_1$ and $T_2$, the slope formula is as follows:

$(P_2 - P_1) / (T_2 - T_1)$

The difference between $T_1$ and $T_2$ is measured in seconds. Therefore, the returned value represents the change in Engineering Units per second.

In this example, point $P_2$ is located at the query start time, and because there is a prior value ($P_1$), the slope of the line through both points is calculated and returned at time $T_S$. Similarly, slopes are calculated to be returned at times $T_3$, $T_4$, $T_7$, and $T_8$. The slope is also calculated for the line through $P_8$ and $P_9$, but that value is returned as point $P_{TE}$ at the query end time.

For point $P_6$, there is no prior point with which to perform a slope calculation. Instead, the slope of the flat line going through the point (that is, the value 0) is calculated. At the time of $P_5$, NULL is returned.

The quality detail and OPC quality returned with a slope point is always directly inherited from the point that also provides the time stamp. In this example, this means that point $P_2$ provides the qualities for the slope point returned at the query start time, $T_S$.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

#### Slope Retrieval - Supported Value Parameters

You can use various parameters to adjust which values are returned in slope retrieval mode. For more information, see the following sections:

- History Version (wwVersion)
- Quality Rule (wwQualityRule)

#### Slope Retrieval - Query Example

To use the slope retrieval mode, set the following parameter in your query.

```
wwRetrievalMode = 'Slope'
```

#### Slope Retrieval - Initial and Final Values

An initial value is always generated. If a point is stored exactly at the query start time, the slope is returned as the slope between that point and the previous point. Otherwise, the slope is calculated using the slope of the points before and after the query start time.

A final value is always generated. If a point is stored exactly at the query end time, the slope is returned as the slope between that point and the previous point. Otherwise, the slope is calculated using the slope of the points before and after the query end time.

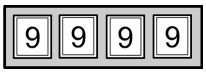
#### Slope Retrieval - Handling NULL Values

The first NULL following a non-NULL value is returned. Subsequent NULL values are not. If a point is preceded by a NULL, the slope for that point will be zero.

### Counter Retrieval

Counter retrieval allows you to accurately retrieve the delta change of a tag's value over a period of time even for tags that are reset upon reaching a "rollover value." The rollover value is defined in the Historian for each tag.

This retrieval mode is useful for determining how much of an item was produced during a particular time period. For example, you might have an integer counter that keeps track of how many cartons were produced. The counter has an indicator like this:




The next value after the highest value that can be physically shown by the counter is called the rollover value. In this example, the rollover value is 10,000. When the counter reaches the 9,999th value, the counter rolls back to 0. Therefore, a counter value of 9,900 at one time and a value of 100 at a later time means that you have produced 200 units during that period, even though the counter value has dropped by 9,800 (9,900 minus 100). Counter retrieval allows you to handle this situation and receive the correct value. For each cycle, the counter retrieval mode shows the increase in that counter during the cycle, including rollovers.

Counter retrieval also works with floating point counters, which is useful for flow meter data. Similar to the carton counter, some flow meters "roll over" after a certain amount of flow accumulates. For both examples, the need is to convert the accumulating measure to a "delta change" value over a given period.

Counter retrieval is a true cyclic mode. It returns one row for each tag in the query for each cycle. The number of cycles is based on the specified resolution or cycle count.

The counter algorithm is only applied to analog tags and to discrete tags. For integer analog tags, the result will be an integer returned as a float data type For a real analog tag, the rollover value and the result may be real

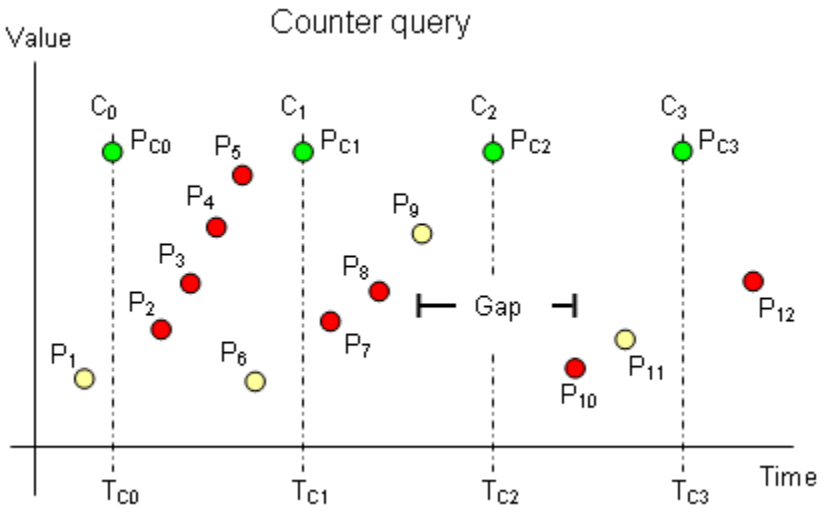
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

values and can include fractional values. If a query contains tags of other types, then no rows are returned for those tags. For discrete tags, the rollover value is assumed to be 2.

The rules used to determine the OPCQuality returned with a counter value are the same as for a time weighted average query. For more information, see Quality Rule (wwQualityRule). When a rollover has occurred in the calculation cycle, a special quality detail of 212 is returned in all non-NULL cases.

### Counter Retrieval - How It Works

The following illustration shows how the counter algorithm determines the count for an analog tag.




This example has a start time of $T_{C0}$ and an end time of $T_{C3}$. The resolution has been set in such a way that the Historian returns data for three complete cycles starting at $T_{C0}$, $T_{C1}$, and $T_{C2}$, and an incomplete cycle starting at $T_{C3}$.

For the queried tag, a total of twelve points are found throughout the cycles represented by the markers $P_1$ through $P_{12}$. Of these points, eleven represent normal analog values. The point $P_9$ represents a NULL due to an I/O Server disconnect, which causes a gap in the data between $P_9$ and $P_{10}$. Point $P_{12}$ is not considered because it is outside of the query time frame.

All points are considered in the counter calculation, but only the yellow ones are actually used to determine which values to return to the client. The returned points are $P_{C0}$, $P_{C1}$, $P_{C2}$ and $P_{C3}$, shown in green at the top to indicate that there is no simple relationship between them and any of the actual points.

All cycle values are calculated as the delta change between the cycle time in question and the previous cycle time, taking into account the number of rollovers between the two points in time. The counter algorithm assumes that a rollover occurred if the current value is lower than the previous value. The initial value at the query start time ($P_{C1}$) is calculated the same way, only based on a phantom cycle before the query start time.

For example, the formula to calculate $P_{C1}$ is as follows:

$P_{C1} = n * V_R + P_6 - P_1$

where:

*n* = the number of rollovers that have occurred during the cycle

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

$V_R$ = the rollover value for the tag

If either *n* or $V_R$ are equal to zero, $P_{C1}$ is simply the difference between the values $P_1$ and $P_6$.

In the case of cycle $C_2$, there is no value at the cycle time, so the NULL value represented by point $P_9$ is returned. In the case of cycle $C_3$, a NULL is again returned, because there is no counter value at the previous cycle boundary to use in the calculation. There must be a full cycle of values in order for the counter to be calculated.

If a gap is fully contained inside a cycle, and if points occur within the cycle on both sides of the gap, then a counter value is returned, even though it may occasionally be erroneous. Zero or one rollovers are assumed, even though the counter might have rolled over multiple times.

### Calculations for a Manually Reset Counter

If you have a counter that you typically reset manually before it rolls over, you must set the rollover value for the tag to 0 so that the count is simply how much change occurred since the manual reset.

For example, assume that you have the following data values for five consecutive cycle boundaries, and that the value 0 occurs as the first value within the last cycle:

100, 110, 117, 123, 3

If you set the rollover value to 0, the counter retrieval mode assumes that the 0 following the value 123 represents a manual reset, and returns a value of 3 for the last cycle, which is assumed to be the count after the manual reset. The value 0 itself does not contribute 1 to the counter value in this case.

If the rollover value is instead set to 200, then the counter retrieval mode assumes that the value 0 represents a normal rollover, and a count of 80 is calculated and returned (200 - 123 + 3). In this case, the value 0 contributes 1 to the counter value, and that is the change from the value 199 to the value 200.

### Counter Retrieval - Supported Value Parameters

You can use various parameters to adjust which values are returned in integral retrieval mode. For more information, see the following sections:

- Cycle Count (X Values over Equal Time Intervals) (wwCycleCount)
- Resolution (Values Spaced Every X ms) (wwResolution)
- History Version (wwVersion)
- Timestamp Rule (wwTimestampRule)
- Quality Rule (wwQualityRule)

### Counter Retrieval - Initial and Final Values

An initial value is returned using the period leading up to the query start time.

A data point that has a cycle time is used to generate the counter value for its preceding cycle. A NULL point with cycle time will cause the preceding cycle to end in a gap and the following cycle to start with a gap.

### Counter Retrieval - Handling NULL Values

If wwQualityRule is configured as OPTIMISTIC, NULL data points will not be used in calculation. 0.0 will be used as the starting base value for the query unless the query data starts with a NULL. If the query starts with a NULL, the value change for the cycle is calculated from the first actual value in the cycle, rather than 0.

Otherwise, if any points considered in a cycle have UNCERTAIN quality, the result for that row will also have UNCERTAIN quality. Any cycle that starts or ends in a gap will have a quality detail of 65536.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

The quality detail of DOUBTFUL will be used with the counter result for the cycles, if a NULL point is considered for the cycle and the counter result is not NULL.

### Counter Retrieval - Handling Illegal Values

If the configured rollover value is larger than 0.0, then the data points whose values are greater than or equal to the rollover value causes the counter value for the cycle to be set to 0.0, with qdIO_FILTEREDPOINT applied to the quality detail.

Similarly, if any data point with a value less than 0.0 is found in a cycle, the counter value for the cycle is set to 0.0, with qdIO_FILTEREDPOINT applied to the quality detail.

### Counter Retrieval - Query Example

To use the counter mode, set the following parameter in your query.

```
wwRetrievalMode = 'Counter'
```

In the following example, the rollover value for the SysTimeSec system tag is set to 0. In a two-minute time span, the SysTimeSec tag increments from 0 to 59 two times. The following query returns the total count within the two-minute time span. The QualityDetail of 212 indicates that a counter rollover occurred during the query time range.

```
select DateTime, TagName, Value, Quality, QualityDetail as QD from History
   where TagName = 'systimesec'
      and DateTime >= '2009-08-13 1:00'
      and DateTime < '2009-08-13 1:02'
      and wwRetrievalMode = 'counter'
      and wwCycleCount = 1
```

The results are:

| DateTime | TagName | Value | Quality | QD |
|---|---|---|---|---|
| 2009-08-13 01:00:00.0000000 | SysTimeSec | 120 | 0 | 212 |

## ValueState Retrieval

ValueState retrieval returns information on how long a tag has been in a particular value state during each retrieval cycle. That is, a time-in-state calculation is applied to the tag value.

This retrieval mode is useful for determining how long a machine has been running or stopped, how much time a process spent in a particular state, how long a valve has been open or closed, and so on. For example, you might have a steam valve that releases steam into a reactor, and you want to know the average amount of time the valve was in the open position during the last hour. ValueState retrieval can return the shortest, longest, average, or total time a tag spent in a state, or the time spent in a state as a percentage of the total cycle length.

When you use ValueState retrieval for a tag in a trend chart, you must specify a single value state for which to retrieve information. ValueState retrieval then returns one value for each cycle—for example, the total amount of time that the valve was in the "open" state during each 1-hour cycle. This information is suitable for trend display.

If you *don't* specify a state, ValueState retrieval returns one row of information for each value that the tag was in during each cycle. For example, this would return not only the time a valve was in the "open" state, but also the time it was in the "closed" state. This information is not suitable for meaningful display in a regular trend. You can, however, retrieve this type of information in a query and view it as a table.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

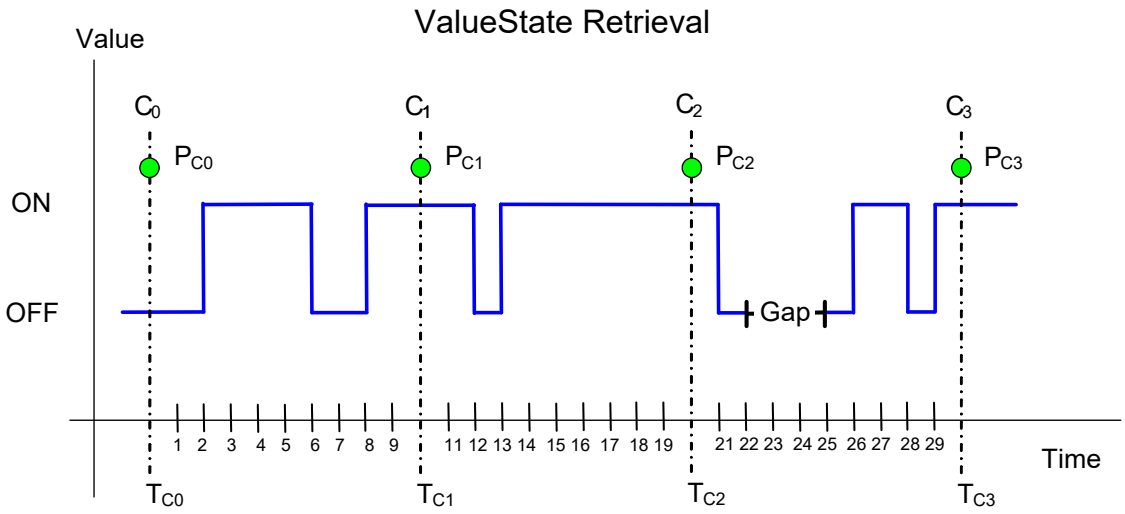
ValueState retrieval works with integer, discrete, string, and state summary tags. For other types of tags, no rows are returned. NULL values are treated like any other distinct state.

The values returned at the query start time are the result of applying the algorithm to a "phantom" cycle preceding the query range. It is assumed that the tag value at the start of the cycle is located at that point in time.

To specify the type of calculation, set the wwStateCalc parameter in the query. For more information, see State Calculation (wwStateCalc).

### ValueState Retrieval - How It Works

The following illustration shows how ValueState retrieval returns values for a discrete tag.




This example has a start time of $T_{C0}$ and an end time of $T_{C3}$. The resolution has been set in such a way that the Historian returns data for three complete cycles starting at $T_{C0}$, $T_{C1}$, and $T_{C2}$, and an incomplete cycle starting at $T_{C3}$. Time is measured seconds.

A gap in the data occurs in the third cycle due to an I/O Server disconnect.

The state calculation is based on each cycle, and the values returned at the query start time are not regular initial values, but are the resulting values that occur after applying the algorithm to the last cycle preceding the query range. The returned points are $P_{C0}$, $P_{C1}$, $P_{C2}$ and $P_{C3}$, shown in green at the top to indicate that there is no simple relationship between the calculated values and any of the actual points.

Assume the query is set so that the total time (wwStateCalc = ‘Total’)in the two states are returned. The timestamping is set to use the cycle end time.

- For $T_{C0}$, the query returns two rows (one for the "on" state and one for the "off" state), calculated as a result of the "phantom" cycle that precedes the query start time. The values have a timestamp of the query start time.
- For $T_{C1}$, one row is returned for the "on" state. The "on" state occurred twice during the cycle--one time for four seconds and again for two seconds before the cycle boundary, and the total time returned is six seconds. The state was "off" twice during the cycle for a total time of four seconds, and one row is returned with that value.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- For $T_{C2}$, one row is returned for the "on" state, and one row is returned for the "off" state. The "on" state occurred for a total of nine seconds between the cycle boundaries, and the "off" state occurred for a total of one second.
- For $T_{C3}$, one row is returned for the "on" state, and one row is returned for the "off" state. The "on" state occurred for a total of four seconds between the cycle boundaries, and the "off" state occurred for a total of three seconds. An additional row is returned for the NULL state occurring as a result of the I/O Server disconnect.

Using the same data, if you queried the **total contained** time for the states, the following is returned:

- For $T_{C0}$, the query returns two values (one for the "on" state and one for the "off" state), calculated as a result of the "phantom" cycle the precedes the query start time. The value has a timestamp of the query start time.
- For $T_{C1}$, one row is returned for the "on" state, and one row is returned for the "off" state. The "on" state occurred one time for four seconds within the cycle. The two seconds of "on" time that crosses the cycle boundary does not contribute to the total time. The state was "off" one time during the cycle for two seconds completely within the cycle boundary.
- For $T_{C2}$, the state was not "on" for any contained time between the cycle. Both occurrences of the "on" state cross over a cycle boundary, so no rows are returned for this state. One row is returned for the "off" state. The state was "off" one time during the cycle for one seconds completely within the cycle boundary.
- For $T_{C3}$, one row is returned for the "on" state, and one row is returned for the "off" state. The state was "on" for a single contained time of two seconds between the cycle boundaries. The state was "off" three times during the cycle for three seconds completely within the cycle boundary. An additional row is returned for the NULL state occurring as a result of the I/O Server disconnect. The state was NULL for a total of three seconds. The I/O Server disconnect that "disrupted" the off state is treated as its own state, thereby changing what would have been a single "off" state instance of five seconds into two instances of the "off" state for one second each.

#### ValueState Retrieval - Supported Value Parameters

You can use various parameters to adjust which values are returned in ValueState retrieval mode. For more information, see the following sections:

- Cycle Count (X Values over Equal Time Intervals) (wwCycleCount)
- Resolution (Values Spaced Every X ms) (wwResolution)
- History Version (wwVersion)
- Timestamp Rule (wwTimestampRule)
- Quality Rule (wwQualityRule)
- State Calculation (wwStateCalc)

#### ValueState Retrieval - Query Examples

To use theValueState retrieval mode, set the following parameter in your query.

```
wwRetrievalMode = 'ValueState'
```

To specify the type of aggregation, set the wwStateCalc parameter in the query, such as:

```
wwStateCalc = 'Total'
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

Be sure that you use the "<=" operator for ending date/time.

#### ValueState Retrieval - Initial and Final Values

The values returned at the query start time are the result of applying the algorithm to the last cycle preceding the query range.

#### ValueState Retrieval - Handling NULL Values

NULLs are considered a state and are reported along with the other states.

### RoundTrip Retrieval

RoundTrip retrieval is very similar to ValueState retrieval in that it performs calculations on state occurrences in the within a cycle period you specify. However, ValueState retrieval uses the time spent in a certain state for the calculation, and RoundTrip retrieval uses the time between consecutive leading edges of the same state for its calculations.

You can use the RoundTrip retrieval mode for increasing the efficiency of a process. For example, if a process produces one item per cycle, then you would want to minimize the time lapse between two consecutive cycles.

The RoundTrip mode returns a rows for each state in any given cycle. RoundTrip retrieval only works with integer analog tags, discrete tags, and string tags. If real analog tags are specified in the query, then no rows are returned for these tags. RoundTrip retrieval is not applied to state summary or analog summary tags. NULL values are treated as any other distinct value and are used to analyze the round trip for disturbances.

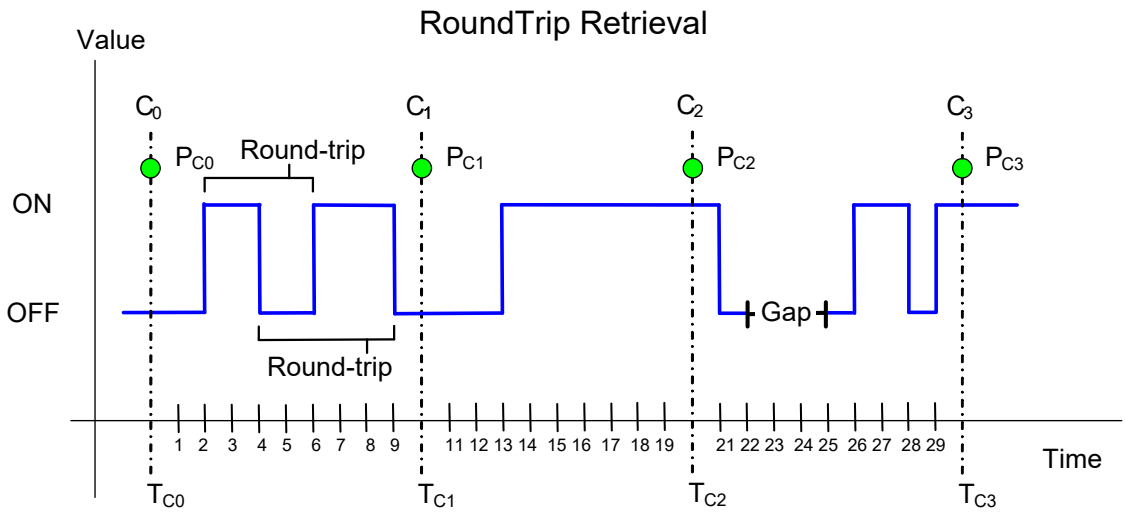
RoundTrip retrieval is supported for the History and StateWideHistory tables.

Any point on the boundary of the end cycle will be considered to the next cycle. The point on the boundary of the end query range is not counted in the calculation except that it is used to indicate that the previous state is a contained state.

If no roundtrip state is found within the cycle for a supported tag, a NULL StateTime value is returned. If there is no valid point prior to the phantom cycle, a NULL state is returned for the phantom cycle.

#### RoundTrip Retrieval - How It Works

The following illustration shows how RoundTrip retrieval returns values for a discrete tag.




© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

This example has a start time of $T_{C0}$ and an end time of $T_{C3}$. The resolution has been set in such a way that the Historian returns data for three complete cycles starting at $T_{C0}$, $T_{C1}$, and $T_{C2}$, and an incomplete cycle starting at $T_{C3}$. Time is measured seconds.

A gap in the data occurs in the third cycle due to an I/O Server disconnect.

The state calculation is based on each cycle, and the values returned at the query start time are not regular initial values, but are the resulting values that occur after applying the algorithm to the last cycle preceding the query range. The returned points are $P_{C0}$, $P_{C1}$, $P_{C2}$ and $P_{C3}$, shown in green at the top to indicate that there is no simple relationship between the calculated values and any of the actual points.

Assume the query is set so that the total contained time in the two states are returned. The timestamping is set to use the cycle end time. The RoundTrip retrieval mode returns values for states that are completely contained within the cycle boundaries. The following is returned:

- For $T_{C0}$, the query returns two values (one for the "on" state and one for the "off" state), calculated as a result of the "phantom" cycle that preceeds the query start time. The value has a timestamp of the query start time.
- For $T_{C1}$, one row is returned for the "on" state, and one row is returned for the "off" state. The round-trip for the "on" state occurred one time for four seconds completely within the cycle boundary. The round-trip for the "off" state occurred one time during the cycle for five seconds.
- For $T_{C2}$, a round-trip did not occur for either state within the cycle boundaries. One NULL row is returned for this cycle.
- For $T_{C3}$, one row is returned for the "on" state, and one row is returned for the "off" state. The state was "on" for a single contained time of two seconds between the cycle boundaries. The state was "off" one time during the cycle for one second completely within the cycle boundary. An additional row is returned for the NULL state occurring as a result of the I/O Server disconnect.
- For $T_{C3}$, one row is returned for the "on" state, and one row is returned for the "off" state. The state was "on" for a single contained time of three seconds between the cycle boundaries. One row is returned for the "off" state for a total contained time of seven seconds. (The first round-trip for the "off" state includes the I/O Server disconnect for a length of four seconds. The second round-trip has a length of three seconds.) An additional row is returned for the NULL state occurring as a result of the I/O Server disconnect, and the returned value is NULL because there is no round-trip during the cycle for it. The I/O Server disconnect that "disrupted" the off state is treated as its own state, thereby changing what would have been a single "off" state instance of five seconds into two instances of the "off" state for one second each.

### RoundTrip Retrieval - Supported Value Parameters

You can use various parameters to adjust the values that must be returned in the RoundTrip retrieval mode. For more information, see the following sections:

- Timestamp Rule (wwTimestampRule)
- Quality Rule (wwQualityRule)
- State Calculation (wwStateCalc)

### RoundTrip Retrieval - Query Examples

To use the RoundTrip retrieval mode, set the following parameter in your query:

```
wwRetrievalMode = ‘RoundTrip’
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

The following queries compare the results between ValueState retrieval and RoundTrip retrieval.

This first ValueState retrieval query returns the average amount of time that the 'Reactor1OutletValve' tag is in "on" state and the average amount of time it is in the "off" state for a single cycle. Any state changes that occur across the cycle boundaries are not included.

```
SELECT DateTime, vValue, StateTime
   FROM History
      WHERE TagName IN ('Reactor1OutletValve')
      AND DateTime >= '2009-09-16 12:35:00'
      AND DateTime <= '2009-09-16 12:55:00'
      AND wwRetrievalMode = 'ValueState'
      AND wwStateCalc = 'AvgContained'
      AND wwCycleCount = 1
```

The results are:

| DateTime | vValue | StateTime |
|---|---|---|
| 2009-09-16 12:35:00.0000000 | 0 | 215878 |
| 2009-09-16 12:35:00.0000000 | 1 | 61729 |
| 2009-09-16 12:55:00.0000000 | 1 | 62827.5 |
| 2009-09-16 12:55:00.0000000 | 0 | 212856 |

The first two rows are for the "phantom" cycle leading up to the query start time and have a timestamp of the query start time.

The second two rows show the average amount of time for each state and have a timestamp of the query end time (the default).

Compare these results to same basic query that instead uses RoundTrip retrieval:

```
SELECT DateTime, vValue, StateTime
   FROM History
      WHERE TagName IN ('Reactor1OutletValve')
      AND DateTime >= '2009-09-16 12:35:00'
      AND DateTime <= '2009-09-16 12:55:00'
      AND wwRetrievalMode = 'RoundTrip'
      AND wwStateCalc = 'AvgContained'
      AND wwCycleCount = 1
```

| DateTime | vValue | StateTime |
|---|---|---|
| 2009-09-16 12:35:00.0000000 | 1 | 277607 |
| 2009-09-16 12:35:00.0000000 | 0 | 278580 |
| 2009-09-16 12:55:00.0000000 | 0 | 275683.5 |
| 2009-09-16 12:55:00.0000000 | 1 | 273845 |

### RoundTrip Retrieval - Initial and Final Values

The values returned at the query start time are the result of applying the algorithm to the last cycle preceding the query range.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

#### RoundTrip Retrieval - Handling NULL Values

Like in the ValueState retrieval mode, the NULL state is treated as a valid distinct value. This allows you to analyze round trips for disturbances.

### Predictive Filter

AVEVA Historian supports predictive retrieval. Beginning with AVEVA Historian 2014 R2 Patch 01, the historian can return predictive data based on a "simple linear regression" (SLR) algorithm. More capabilities will be added in future releases.

With AVEVA Historian, you can create a query based on data you have stored to predict additional values in a trend. Historian returns predictive data based on a "simple linear regression" (SLR) algorithm.

For example, based on your currently stored values, you could use the predictive retrieval feature to help predict if a certain production target will be met by the end of the shift. Or, if the Historian loses communication with the data source, you could use predictive retrieval to determine whether and when a tank is likely to become empty.

You can predict:

- Values in between other values.
- Values that extend beyond stored values.

For example, suppose you already captured data for a tag with timestamps up to 3 p.m. on a certain day, but not for the rest of the shift, which ran until 5 p.m., because of a power cut. With predictive retrieval, you can view the interpolated results based between 3 p.m. and 5 p.m. These results are based on the data you received through 3 p.m.

The following is an example of a query that retrieves stored values and reports both those values and additional predictive data:

```
SELECT DateTime, Value, wwFilter
FROM History
   WHERE TagName = 'Tag1'
      AND DateTime >= '2014-01-01 0:00:00.000'
      and DateTime < '2014-01-01 1:00:00.000'
      and wwFilter = 'SLR()'
```

In this example, "SLR" stands for "simple linear regression," the algorithm used by AVEVA Historian to analyze currently stored values and predict other values within the detected trend.

### Bounding Value Retrieval

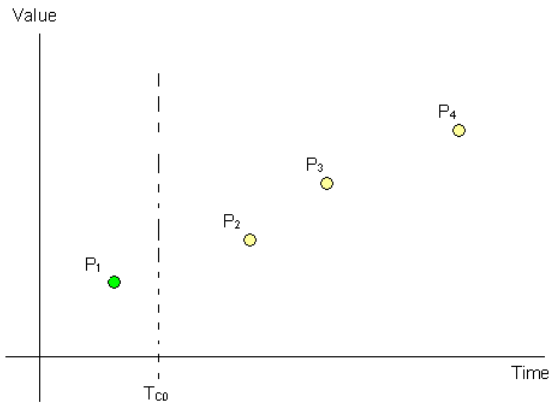
The bounding value retrieval mode returns either the start bound point or the end bound point for a requested point in time. For a start bound point, Historian retrieves the first value on or before the requested date/time. For an end bound point, Historian retrieves the first value after the requested date/time.

If no time is specified, Historian returns the bounding point at the current time.

#### Bounding Value Retrieval - How It Works

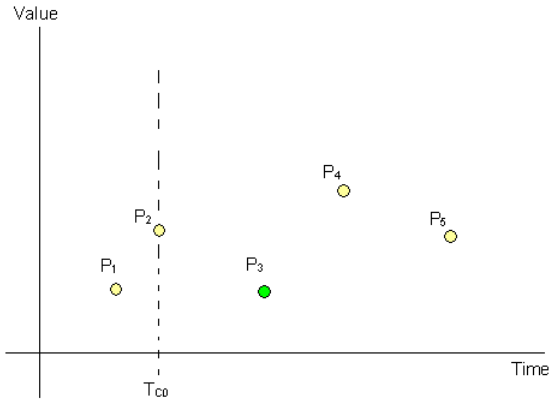
The following illustration shows how bounding value retrieval returns a start bound point:

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




In this case, Historian retrieves the first point on or before the datetime requested in the query. The line ($T_{C0}$) is the timestamp for which the start bound point is requested. $P_1$ is returned because that is the start or first point for the query date time.

Historian can also use bounding value retrieval to return an end bound point, as in the following illustration:




In this case, Historian returns first point after the datetime requested in the query. $T_{C0}$ is the timestamp for which the end bound point is requested and $P_3$ is returned as the ending bound point because this is the first point after the query date time.

### Bounding Value Retrieval - Query Examples

You can use the Bounding Value retrieval mode to return a start bound point or an end bound point for a specified date and time. If no time is specified, Historian returns the bounding point at the current time.

To return a start bound point, set the following parameter in your query.

```
wwRetrievalMode = 'StartBound'
```

To return an end bound point, set the following parameter in your query.

```
wwRetrievalMode = 'EndBound'
```

### Example 1 - Retrieve start bound point

```
select DateTime,TagName,Value
where TagName 'Plant2.R31.BatchNum'
and wwRetrievalMode = 'StartBound'
and DateTime >= '2019-04-24 12:00:00'
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

The results are:

| DateTime | TagName | Value |
|---|---|---|
| 2019-04-24 11:53:08.5430000 | Plant2.R31.BatchNum | 912 |

**Example 2 - Retrieve end bound point**

```
select DateTime,TagName,Value
where TagName in 'Plant2.R31.BatchNum'
and wwRetrievalMode = 'EndBound'
and DateTime >= '2019-04-24 12:00:00'
```

The results are:

| DateTime | TagName | Value |
|---|---|---|
| 2019-04-24 14:11:13.3840000 | Plant2.R31.BatchNum | 926 |

## Understanding Retrieval Options

In all retrieval modes, you can adjust which values the Historian returns by specifying retrieval options. The retrieval options are implemented as special parameters that you set as part of the retrieval query. This section explains each of these options. For an overview of which options apply to which retrieval modes, see Which Options Apply to Which Retrieval Modes?.

### Which Options Apply to Which Retrieval Modes?

The following table shows which retrieval options apply to which modes. If you specify an option in a mode where it isn't applicable, the option is ignored.

| | Cycle Count (X Values over Equal Time Intervals) (wwCycleCount) | Resolution (Values Spaced Every X ms) (wwResolution) | Time Deadband (wwTimeDeadband) | Value Deadband (wwValueDeadband) | History Version (wwVersion) | Interpolation Type (wwInterpolationType) | Timestamp Rule (wwTimestampRule) | Quality Rule (wwQualityRule) | State Calculation (wwStateCalc) | Analog Value Filtering (wwFilter) | Edge Detection for Events (wwEdgeDetection) | Predictive Filter** | Expressions (wwExpression) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cyclic Retrieval | Y | Y | | | Y | | Y* | | | Y | Y | | Y |
| Delta Retrieval | | | Y | Y | Y | | | | | Y | Y | Y | Y |
| Full Retrieval | | | | | Y | | | | | Y | Y | Y | Y |
| Interpolated Retrieval | Y | Y | | | Y | Y | Y | Y | | Y | Y | | |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | Cycle Count (X Values over Equal Time Intervals) (wwCycleCount) | Resolution (Values Spaced Every X ms) (wwResolution) | Time Deadband (wwTimeDeadband) | Value Deadband (wwValueDeadband) | History Version (wwVersion) | Interpolation Type (wwInterpolationType) | Timestamp Rule (wwTimestampRule) | Quality Rule (wwQualityRule) | State Calculation (wwStateCalc) | Analog Value Filtering (wwFilter) | Edge Detection for Events (wwEdgeDetection) | Predictive Filter** | Expressions (wwExpression) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| "Best Fit" Retrieval | Y | Y | | | Y | Y | | Y | | Y | Y | Y | Y |
| Average Retrieval | Y | Y | | | Y | Y | Y | Y | | Y | Y | | |
| Minimum Retrieval | Y | Y | | | Y | | | Y | | Y | Y | | |
| Maximum Retrieval | Y | Y | | | Y | | | Y | | Y | Y | | |
| Integral Retrieval | Y | Y | | | Y | Y | Y | Y | | Y | Y | | |
| Slope Retrieval | | | | | Y | | | Y | | Y | Y | | |
| Counter Retrieval | Y | Y | | | Y | | Y | Y | | Y | | | |
| ValueState Retrieval | Y | Y | | | Y | | Y | Y | Y | Y | | | |
| RoundTrip Retrieval | Y | Y | | | Y | | Y | Y | Y | Y | | | |
| Bounding Value Retrieval | Y | Y | | | | | | | | | | | |

* - only on AVEVA Historian 9.0 and later
** - only AVEVA Historian 2014 R2 P01 and later

### Using Retrieval Options in a Transact-SQL Statement

You can retrieve data in the Historian extension tables using normal Transact-SQL code, as well as the specialized SQL time domain extensions provided by the Historian. The Historian extensions provide an easy way to query time-based data from the history tables. They also provide additional functionality not supported by Transact-SQL.

**Note:** The wwParameters extension is reserved for future use. The wwRowCount parameter is still supported, but is deprecated in favor of wwCycleCount.

The extensions are implemented as "virtual" columns in the extension tables. When you query an extension table, you can specify values for these column parameters to manipulate the data that will be returned. You will need to specify any real-time extension parameters each time that you execute the query.

For example, you could specify a value for the wwResolution column in the query so that a resolution is applied to the returned data set:

```
SELECT DateTime, Value
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

```
FROM History
   WHERE TagName = 'SysTimeSec'
      AND DateTime >= '2001-12-02 10:00:00'
      AND DateTime <= '2001-12-02 10:02:00'
      AND Value >= 50
      AND wwResolution = 10
      AND wwRetrievalMode = 'cyclic'
```

Although the Microsoft SQL Server may be configured to be case-sensitive, the values for the virtual columns in the extension tables are always case-insensitive.

**Note:** You cannot use the IN clause or OR clause to specify more than one condition for a time domain extension. For example, "`wwVersion IN ('original', 'latest')`" and "`wwRetrievalMode = 'Delta' OR wwVersion = 'latest'`" are not supported.

For general information on creating SQL queries, see your Microsoft SQL Server documentation.

### Cycle Count (X Values over Equal Time Intervals) (wwCycleCount)

In retrieval modes that use cycles, the cycle count determines the number of cycles for which data is retrieved. The number of actual return values is not always identical with this cycle count. In "truly cyclic" modes (Cyclic, Interpolated, Average, and Integral), a single data point is returned for every cycle boundary. However, in other cycle-based modes (Best Fit, Minimum, Maximum, Counter, ValueState, and RoundTrip), multiple or no data points may be returned for a cycle, depending on the nature of the data.

The length of each cycle (the "resolution" of the returned values) is calculated as follows:

$D_C = D_Q / (n - 1)$

Where $D_C$ is the length of the cycle, $D_Q$ is the duration of the query, and n is the cycle count.

Instead of specifying a cycle count, you can specify the resolution. In that case, the cycle count is calculated based on the resolution and the query duration. For more information, see Resolution (Values Spaced Every X ms) (wwResolution).

This option is relevant in the following retrieval modes:

- Cyclic Retrieval
- Interpolated Retrieval
- "Best Fit" Retrieval
- Average Retrieval
- Minimum Retrieval
- Maximum Retrieval
- Integral Retrieval
- Counter Retrieval
- ValueState Retrieval
- RoundTrip Retrieval

The application of the cycle count also depends on whether you are querying a wide table. If you are querying the History table, the cycle count determines the number of rows returned per tag. For example, a query that applies a cycle count of 20 to two tags will return 40 rows of data (20 rows for each tag). If you are querying a

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

WideHistory table, the cycle count specifies the total number of rows to be returned, regardless of how many tags were queried. For example, a query that applies a cycle count of 20 to two tags returns 20 rows of data.

Values chosen:

- If wwResolution and wwCycleCount are not specified, then a default of 100 cycles are chosen.
- If wwResolution and wwCycleCount are set to 0, then a default of 100000 cycles are chosen.
- If wwResolution and wwCycleCount are both set, then wwCycleCount is ignored.
- If wwCycleCount is specified and is less than 0, then a default of 100 cycles are chosen.
- For ValueState retrieval, if the start time of the cycle is excluded, no states are returned for the first cycle.
- For ValueState retrieval, if the end time of the cycle is excluded, no states are returned for the last cycle.

For more information, see Understanding Retrieval Options.

### Resolution (Values Spaced Every X ms) (wwResolution)

In retrieval modes that use cycles, the resolution is the sampling interval for retrieving data, that is, the length of each cycle.

The number of cycles, therefore, depends on the time period and the resolution:

number of cycles = time period / resolution

The number of actual return values is not always identical with this cycle count. In "truly cyclic" modes (Cyclic, Interpolated, Average, and Integral), a single data point is returned for every cycle boundary. However, in other cycle-based modes (Best Fit, Minimum, Maximum, Counter, and ValueState), multiple or no data points may be returned for a cycle, depending on the nature of the data.

**Note:** The rowset is guaranteed to contain one row for each tag in the normalized query at every resolution interval, regardless of whether a physical row exists in history at that particular instance in time. The value contained in the row is the last known physical value in history, at that instant, for the relevant tag.

Instead of specifying a resolution, you can specify the cycle count directly. In that case, the resolution is calculated based on the cycle count and the query duration. For more information, see Cycle Count (X Values over Equal Time Intervals) (wwCycleCount).

This option is relevant in the following retrieval modes:

- Cyclic Retrieval
- Interpolated Retrieval
- "Best Fit" Retrieval
- Average Retrieval
- Minimum Retrieval
- Maximum Retrieval
- Integral Retrieval
- Counter Retrieval
- ValueState Retrieval
- RoundTrip Retrieval

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

For delta retrieval, you can achieve similar results by using a time deadband. For more information, see Time Deadband (wwTimeDeadband).

### Resolution - Query Examples

The following query returns rows that are spaced at 2 sec (2000 msec) intervals over the requested time period. Data is retrieved cyclically.

```
SELECT DateTime, TagName, Value
   FROM History
      WHERE TagName IN ('SysTimeMin','SysTimeSec')
         AND DateTime >= '2001-12-09 11:35'
         AND DateTime <= '2001-12-09 11:36'
         AND wwRetrievalMode = 'Cyclic'
         AND wwResolution = 2000
```

The results are:

```
DateTime                    TagName          Value

2001-12-09 11:35:00.000     SysTimeMin       35

2001-12-09 11:35:00.000     SysTimeSec       0

2001-12-09 11:35:02.000     SysTimeMin       35

2001-12-09 11:35:02.000     SysTimeSec       2

2001-12-09 11:35:04.000     SysTimeMin       35

2001-12-09 11:35:04.000     SysTimeSec       4

2001-12-09 11:35:06.000     SysTimeMin       35

.

.

.

2001-12-09 11:35:54.000     SysTimeMin       35

2001-12-09 11:35:54.000     SysTimeSec       54

2001-12-09 11:35:56.000     SysTimeMin       35

2001-12-09 11:35:56.000     SysTimeSec       56

2001-12-09 11:35:58.000     SysTimeMin       35

2001-12-09 11:35:58.000     SysTimeSec       58

2001-12-09 11:36:00.000     SysTimeMin       36

2001-12-09 11:36:00.000     SysTimeSec       0
```

## About "Phantom" Cycles

The phantom cycle is the name given to the cycle that leads up to the query start time. It is used to calculate which initial value to return at the query start time for all retrieval modes. Some retrieval modes use the phantom cycle to simply find the last known value prior to the query start time, whereas other retrieval modes

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

use the entire cycle to calculate aggregates. The different uses of the phantom cycle can be seen in the following table.

| Simple use of phantom cycle | Cycles not defined, but similar simple use of time before query start time | Phantom cycle used to calculate aggregates |
|---|---|---|
| Cyclic | Delta | Min |
| Interpolated | Full | Max |
| Best Fit | Slope | Average |
| | | Integral |
| | | Counter |
| | | ValueState |
| | | RoundTrip |

It's common to expect a single aggregate row returned for a particular time interval. You can accomplish this in several ways.

The following example is querying for hourly averages. It returns a single row time stamped at the query start time. If the query included the query end point by including an equal sign for it, the query would also have returned an additional row at the query end time.

```
SELECT DateTime, Value, Quality, QualityDetail, OPCQuality
   FROM History
      WHERE TagName IN ('SysTimeSec')
         AND DateTime >= '2009-10-16 08:00:00'
         AND DateTime < '2009-10-16 09:00:00'
         AND wwRetrievalMode = 'Avg'
         AND wwResolution = 3600000
```

The results are:

```
DateTime                          Value     Quality     QualityDetail     OPCQuality

2009-10-16 08:00:00.0000000       29.5      0           192               192
```

What may be confusing in this example is the calculation of the average in the returned row for the phantom cycle leading up to the query start time. The query specifies a positive one hour time interval between the query start time and the query end time. You may therefore expect that the calculated and returned average should be for the specified interval.

However, the time difference between start and end time in the above query is actually not required because the resolution has been provided explicitly (wwResolution = 36000000). If the query specified an end time equal to the specified start time and if it included the equal sign for the end time, the query would still return the same single row of data.

```
SELECT DateTime, Value, Quality, QualityDetail as QD, OPCQuality
   FROM History
      WHERE TagName IN ('SysTimeSec')
         AND DateTime >= '2007-12-11 08:00:00'
         AND DateTime <= '2007-12-11 09:00:00'
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

```
        AND wwRetrievalMode = 'Avg'
        AND wwCycleCount = 1
```

The results are:

| DateTime | Value | Quality | QD | OPCQuality |
|---|---|---|---|---|
| 2009-10-16 08:00:00.0000000 | 29.5 | 0 | 192 | 192 |

This second example also asks for hourly averages and it also returns only a single row of data stamped at the query start time. This query, however, must specify a time difference between the start and end time, because the resolution is not explicitly defined in the query.

As in the preceding query, the specified interval and cycle count of 1 may look like the returned row has been calculated for the specified interval, but the returned row is once again for the phantom cycle leading up to the start time.

The StartDateTime makes it easier to see which time interval was used to calculate the returned aggregate. This column returns the time stamp of the beginning of the cycle used for the aggregate calculation. The time stamp is always returned in accordance with the specified time zone and always has the same offset as the time stamp returned in the DateTime column, even when the two time stamps are on different sides of a DST change.

Assuming results are timestamped at the end of the cycle (as is done by default when wwTimeStampRule is set to END), the initial rows in the examples above would return a DateTime equal to '2009-10-16 08:00:00', and the StartDateTime column would return '2009-10-16 07:00:00' making it easy to interpret the result.

If instead the query were to ask for results time stamped at the beginning of the cycle with wwTimeStampRule set to START, the initial rows in the same examples would still return a DateTime equal to '2009-10-16 08:00:00', but the time stamp has now been shifted in accordance with the time stamp request. The result is therefore calculated for the specified time interval between 8 a.m. and 9 a.m. In this example, the new StartDateTime column would return the same time stamp as the DateTime column, '2009-10-16 08:00:00', again making it easier to interpret the result.

For retrieval modes for which cycles are defined, the StartDateTime column returns the cycle start time. These modes are:

- Cyclic
- Interpolated
- BestFit
- Min
- Max
- Average
- Integral
- Counter
- ValueState
- RoundTrip

In the remaining retrieval modes, the StartDateTime column returns the same time stamp as the DateTime column.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

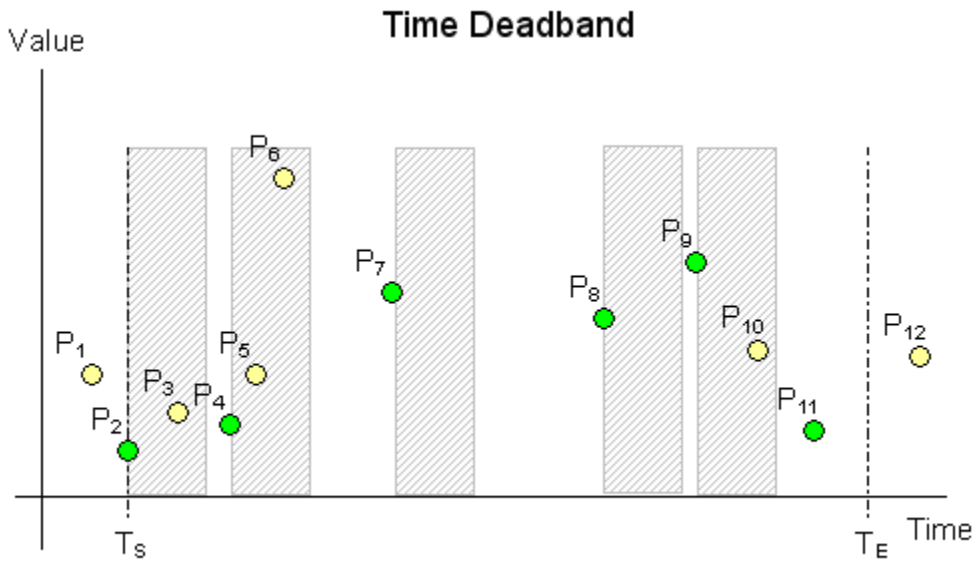
### Time Deadband (wwTimeDeadband)

A time deadband for retrieval controls the time resolution of data returned in delta mode. Any value changes that occur within the time deadband are not returned.

Time deadbands can be applied to analog, discrete, and string tags.

The deadband "base value" is reset each time that a value is returned, so that the last value returned acts as the basis for the deadband.

The following illustration shows an example of applying a time deadband:




Data is retrieved for the time period starting with $T_S$ and ending with $T_E$. All points in the graphic represent data values stored on the Historian. The grey areas represent the time deadband, which starts anew with every returned value. Only the green points ($P_2$, $P_4$, $P_7$, $P_8$, $P_9$, $P_{11}$) are returned. The other points are not returned because they fall within a deadband.

#### Time Deadband - Query Examples

To apply a time deadband, set the wwTimeDeadband parameter in your query.

The following queries return data values for the analog tag 'SysTimeSec'.

### Value Deadband (wwValueDeadband)

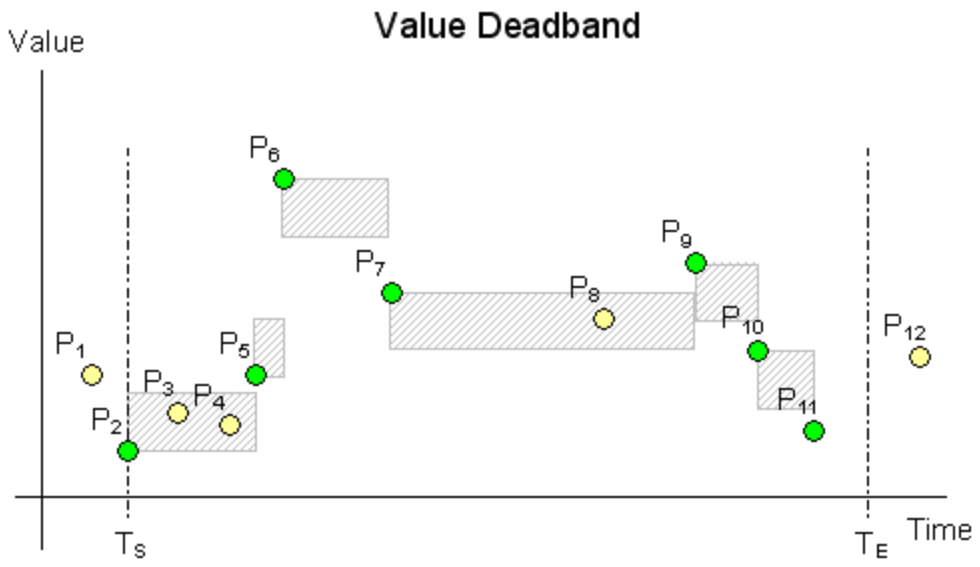
A value deadband for retrieval controls the value resolution of data returned in delta mode. Any data values that change less than the specified deadband are not returned. The deadband is a percentage of a tag's full scale in engineering units.

The deadband "base value" is reset each time that a value is returned, so that the last value returned acts as the basis for the deadband.

Changes in quality will force a value to be returned even if the value deadband has not been met.

The following illustration shows an example of applying a value deadband:

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




Data is retrieved for the time period starting with $T_S$ and ending with $T_E$. All points in the graphic represent data values stored on the Historian. The grey areas represent the value deadband, which starts anew with every returned value. Only the green points ($P_2$, $P_5$, $P_6$, $P_7$, $P_9$, $P_{10}$, $P_{11}$) are returned. The other points are not returned because they fall within a deadband.

#### Value Deadband - Query Examples

The following queries return data values for the analog tag 'SysTimeSec'. The minimum engineering unit for 'SysTimeSec' is 0, and the maximum engineering unit is 59.

### History Version (wwVersion)

The Historian allows you to overwrite a stored tag value with later versions of the value. The original version of the value is still maintained, so that effectively, multiple versions of the tag value exist at the same point in time.

When retrieving data, you can specify whether to retrieve the originally stored version or the latest version that is available. To do this, set the history version option to "Original" for the original version or "Latest" for the latest available version. If you do not specify the version, the latest version is returned.

To distinguish between a latest value and an original value, the Historian returns a special QualityDetail value of 202 for a latest point with good quality.

This option is relevant in all retrieval modes.

#### History Version - Query Example

For example:

```
SELECT TagName, DateTime, Value, wwVersion
   FROM History
      WHERE TagName IN ('SysTimeHour', 'SysTimeMin')
         AND DateTime >= '2001-12-20 0:00'
         AND DateTime <= '2001-12-20 0:05'
         AND wwRetrievalMode = 'Delta'
         AND wwVersion = 'Original'
```

The results are:

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| TagName | DateTime | Value | wwVersion |
|---|---|---|---|
| SysTimeMin | 2001-12-20 00:00:00.000 | 0 | ORIGINAL |
| SysTimeHour | 2001-12-20 00:00:00.000 | 0 | ORIGINAL |
| SysTimeMin | 2001-12-20 00:01:00.000 | 1 | ORIGINAL |
| SysTimeMin | 2001-12-20 00:02:00.000 | 2 | ORIGINAL |
| SysTimeMin | 2001-12-20 00:03:00.000 | 3 | ORIGINAL |
| SysTimeMin | 2001-12-20 00:04:00.000 | 4 | ORIGINAL |
| SysTimeMin | 2001-12-20 00:05:00.000 | 5 | ORIGINAL |

When retrieving the latest version, the wwVersion parameter always returns with a value of LATEST for all values, even though many of the values may actually be the original values that came from the I/O Server. To distinguish between an actual latest value and an original value, a special QualityDetail of 202 is returned for a good, latest point.

For example:

```
SELECT DateTime, Value, Quality, QualityDetail, OPCQuality, wwVersion FROM History
   WHERE TagName IN ('PV')
      AND DateTime >= '2005-04-17 11:35:00'
      AND DateTime <= '2005-04-17 11:36:00'
      AND wwRetrievalMode = 'Delta'
      AND wwVersion = 'Latest'
```

The results are:

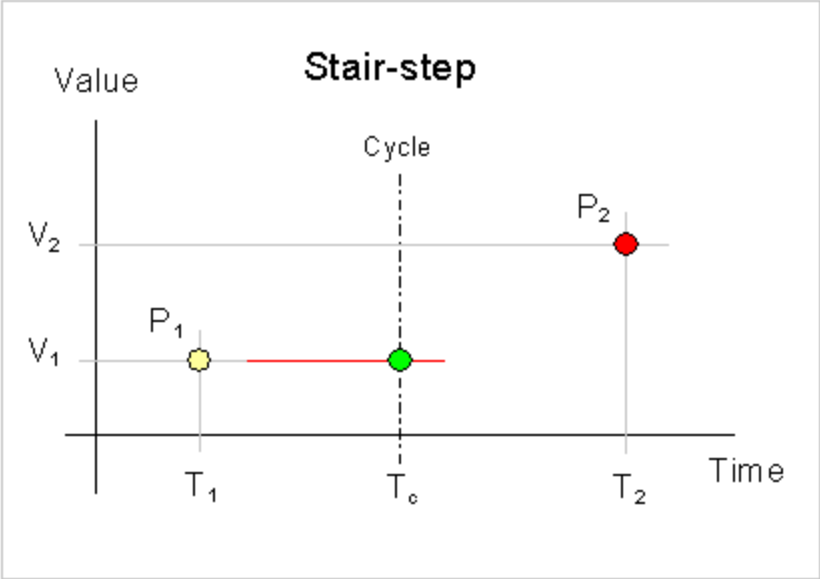
| DateTime | Value | Quality | QualityDetail | OPCQuality | wwVersion |
|---|---|---|---|---|---|
| 2005-04-17 11:35:00.000 | 12.5 | 0 | 192 | 192 | LATEST |
| 2005-04-17 11:35:15.000 | 17.3 | 0 | 192 | 192 | LATEST |
| 2005-04-17 11:35:30.000 | 34.0 | 0 | 202 | 192 | LATEST |
| 2005-04-17 11:35:45.000 | 43.1 | 0 | 192 | 192 | LATEST |
| 2005-04-17 11:36:00.000 | 51.2 | 0 | 192 | 192 | LATEST |

### Interpolation Type (wwInterpolationType)

For various retrieval modes, you can control how analog tag values at cycle boundaries are calculated if there is no actual value stored at that point in time. The options are as follows:

- **Stairstep:** No interpolation occurs. The value at the cycle boundary is assumed to be the same value as the last stored value before the cycle boundary.The last known point is returned with the given cycle time. If no valid value can be found, a NULL is returned.

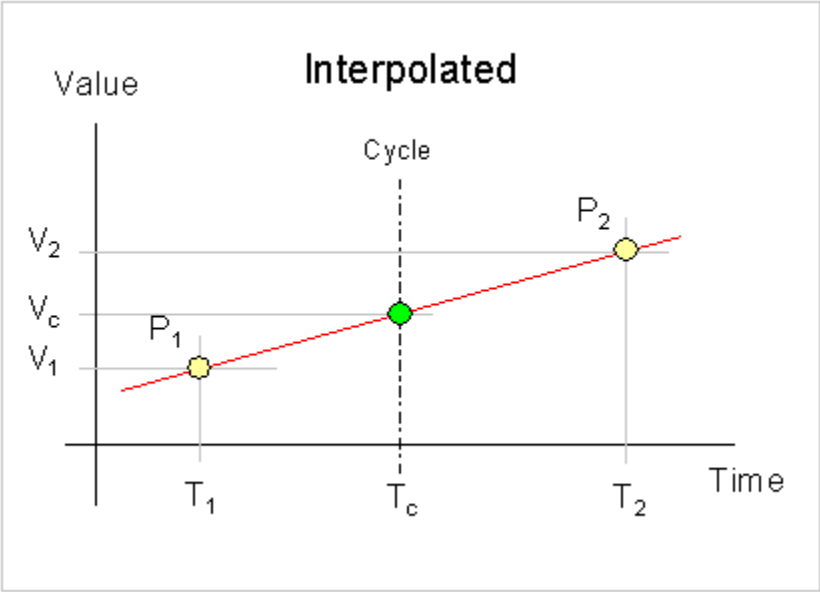
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




- **Linear:** The Historian calculates a new value at the cycle boundary by interpolating between the last stored value before the boundary and the first stored value after the boundary. If either of these values is NULL, it returns the last stored value before the boundary.

  Expressed as a formula, $V_c$ is calculated as:

  $V_c = V_1 + ((V_2 - V_1) * ((T_c - T_1) / (T_2 - T_1)))$




The type of data that you want to retrieve usually determines the interpolation type to use. For example, if you have a thermocouple, the temperature change is linear, so it's best to use linear interpolation. If you have a tag that contains discrete measurements, such as a set point, then you probably want to use stair-stepped values. In general, it is recommended that you use linear interpolation as the general setting, and use stair-stepped values for the exceptions.

This option is relevant in the following retrieval modes:

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- Interpolated Retrieval
- "Best Fit" Retrieval
- Average Retrieval
- Integral Retrieval

The quality of an interpolated point is determined by the wwQualityRule setting. For more information, see Quality Rule (wwQualityRule).

The interpolation type can be set on three levels:

- The Historian system-wide setting. The system-wide setting must be either stair-step or interpolated. This setting is configured using the Historian Configuration Editor.
- The individual analog tag setting. You can configure an individual analog tag to use the system-wide setting or either stair-stepped values or linear interpolation. The individual tag setting will override the system-wide setting. This setting is configured using the Historian Configuration Editor.
- The setting for the wwInterpolationType parameter in the query. This setting overrides any other setting for all tags in the query.

The wwInterpolationType parameter is dynamically used both for input for the query, when you need to override the individual tag settings, and for output for each individual row to show whether a particular row value was calculated using linear interpolation (returned as "LINEAR") or if it is a stair-stepped value (returned as "STAIRSTEP").

To force a query to always use linear interpolation whenever applicable, specify the following in the query:

```
AND wwInterpolationType = 'Linear'
```

To force a query to always return stair-stepped values, specify the following in the query:

```
AND wwInterpolationType = 'StairStep'
```

### Timestamp Rule (wwTimestampRule)

For various cycle-based retrieval modes, you can control whether the returned values are timestamped at the beginning or at the end of each cycle.

To force a query to timestamp results at the start of a cycle, specify the following in the query:

```
AND wwTimeStampRule = 'Start'
```

To force a query to timestamp results at the end of a cycle, specify the following in the query:

```
AND wwTimeStampRule = 'End'
```

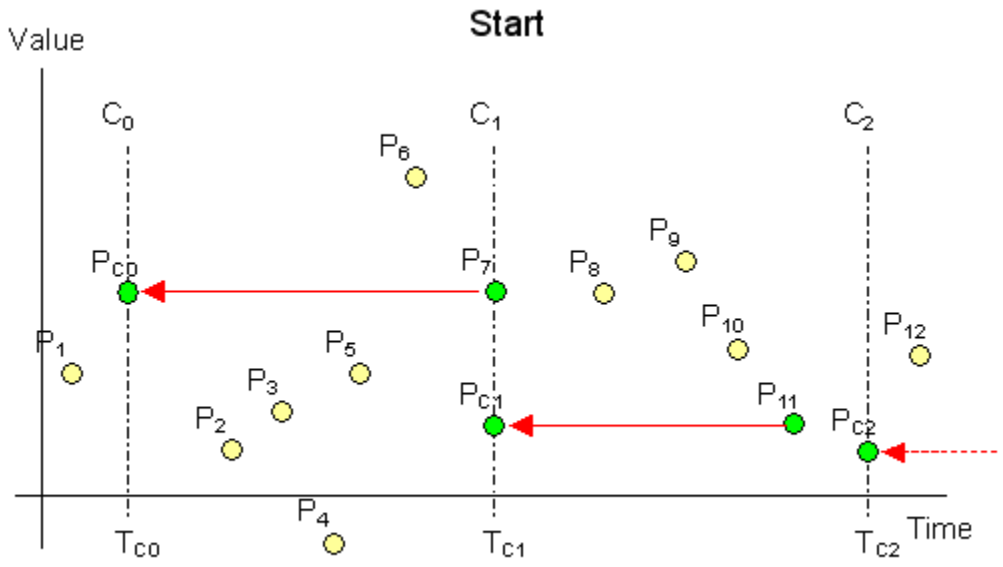
If you include the wwTimeStampRule column in your SELECT statement, it will show which timestamp rule has been applied for the individual row, if applicable.

The options are as follows:

- **Start:** The value for a given cycle is stamped with the cycle start time. For example, in the following illustration of a cyclic query, the following values are returned at the cycle boundaries:
  - At $T_{C0}$: $P_7$, because it falls on the cycle boundary. In cyclic mode, if there is a value right on the cycle boundary, it is considered to belong to the cycle before the boundary. In this case, this is the cycle starting at $T_{C0}$ and ending at $T_{C1}$, and because the Start timestamp rule is used, the value is timestamped at $T_{C0}$.
  - At $T_{C1}$: $P_{11}$, because it is the last value in the cycle starting at $T_{C1}$ and ending at $T_{C2}$

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- At $T_{C2}$: The last value in the "phantom" cycle starting at $T_{C2}$




- **End:** The value for a given cycle is stamped with the cycle end time. For example, in the following illustration of a cyclic query, the following values are returned at the cycle boundaries:
  - At $T_{C0}$: $P_1$, because it is the last value in the "phantom" cycle ending at $T_{C0}$. Because the End timestamp rule is used, the value is timestamped at $T_{C0}$.
  - At $T_{C1}$: $P_7$, because it falls on the cycle boundary. In cyclic mode, if there is a value right on the cycle boundary, it is considered to belong to the cycle before the boundary. In this case, this is the cycle starting at $T_{C0}$ and ending at $T_{C1}$, and because the End timestamp rule is used, the value is timestamped at $T_{C1}$.
  - At $T_{C2}$: $P_{11}$, because it is the last value in the cycle ending at $T_{C2}$.
- **Server default:** Either Start or End is used, depending on the system parameter setting on the Historian.

This option is relevant in the following retrieval modes:

- Cyclic Retrieval (only for Historian 9.0 and later)
- Interpolated Retrieval
- Average Retrieval
- Integral Retrieval
- Counter Retrieval
- ValueState Retrieval
- RoundTrip Retrieval

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Time Zone (wwTimeZone)

For Historian version 8.0 and later, all history data is stored in Coordinated Universal Time (UTC). The wwTimeZone extension allows you to specify the time zone to be used for the timestamps of the returned data values. The retrieval subsystem will convert the timestamps to local time in the specified time zone.

The wwTimeZone extension may be assigned any of the values stored in the TimeZone column of the TimeZone table in the Runtime database. In addition to specifying the name of the timezone in the wwTimeZone parameter, you can also specify the TimeZoneID (as a string). For example, on a typical US English system, specifying " `wwTimeZone = 'Mountain Standard Time'` " and " `wwTimeZone = '64'` " yields the same result.

The TimeZone table is repopulated at every system startup from Microsoft operating system registry entries, and will therefore reflect the time zones available from the server operating system, including any new or custom time zones which might be added by operating system service packs or installed software.

The retrieval subsystem will automatically correct for daylight savings time in the requested time zone. When computing daylight savings and time zone parameters, the settings of the server operating system are used. The retrieval sub-system does not provide any means for using client-side settings.

If wwTimeZone is not specified, the time zone for retrieval defaults to the time zone of the Historian computer.

For example:

```
SELECT TagName, DateTime, Value, wwTimeZone
   FROM History
      WHERE TagName IN ('SysTimeHour', 'SysTimeMin')
         AND DateTime >= '2001-12-20 0:00'
         AND DateTime <= '2001-12-20 0:05'
         AND wwRetrievalMode = 'Delta'
         AND wwTimeZone = 'W. Europe Standard Time'
```

The results are:

```
TagName          DateTime              Value     wwTimeZone
SysTimeMin       2001-12-20            0         W. Europe Standard Time
                 00:00:00.000
SysTimeHour      2001-12-20            15        W. Europe Standard Time
                 00:00:00.000
SysTimeMin       2001-12-20            1         W. Europe Standard Time
                 00:01:00.000
SysTimeMin       2001-12-20            2         W. Europe Standard Time
                 00:02:00.000
SysTimeMin       2001-12-20            3         W. Europe Standard Time
                 00:03:00.000
SysTimeMin       2001-12-20            4         W. Europe Standard Time
                 00:04:00.000
SysTimeMin       2001-12-20            5         W. Europe Standard Time
                 00:05:00.000
```

If you are using date/time functions and the wwTimeZone parameter, you will need to use the **faaTZgetdate()** function.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Quality Rule (wwQualityRule)

For various retrieval modes, you can explicitly exclude values with uncertain quality from data retrieval in modes that calculate return values.

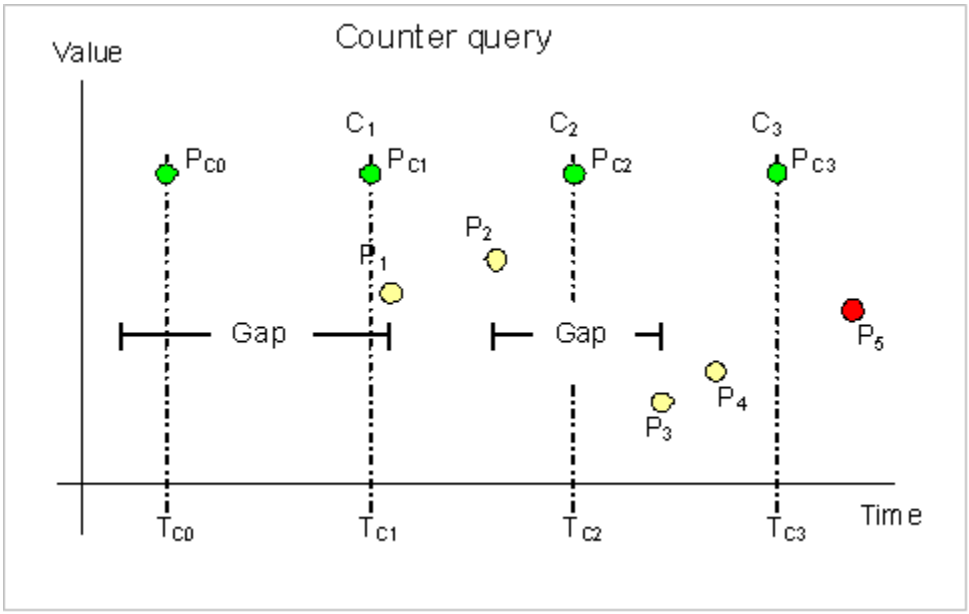
Where applicable, the quality rule can be used to specify whether values with certain characteristics are explicitly excluded from consideration by data retrieval. This parameter will override the setting of the QualityRule system parameter. Valid values are GOOD, EXTENDED, or OPTIMISTIC.

- A quality rule of GOOD means that data values with uncertain (64) OPC quality are not used in the retrieval calculations and are ignored. Values with bad QualityDetail indicate gaps in the data.
- A quality rule of EXTENDED means that data values with both good and uncertain OPC quality are used in the retrieval calculations. Values with bad QualityDetail indicate gaps in the data.
- A quality rule of OPTIMISTIC means that calculations that include some good and some NULL values do not cause the overall calculations to return NULL.

You can apply a quality rule to all retrieval modes.

The OPTIMISTIC setting for the quality rule lets you retrieve information that is possibly incomplete but may nevertheless provide better results in the counter and integral retrieval modes where the calculation cycle contains data gaps. This setting calculates using the last known good value prior to the gap (if possible). The logic for determining the quality of the points returned remains unchanged in both retrieval modes. The integral retrieval mode is an exception to this where the integral is scaled up to cover gaps. For more information, see Integral Retrieval.

The following figure shows a counter retrieval situation in which three of the four shown cycle boundaries are located in data gaps. Without using OPTIMISTIC, counter queries would return a NULL at all cycle boundaries because the mode needs valid good values at each end of the cycle calculate a precise difference.




If the query were to specify OPTIMISTIC, the counter mode will always return rows with numeric counter values and good quality. These rows may or may not be precise. The PercentGood column of the row returns the percentage of time in each cycle in which retrieval was able to find values stored with good quality, so if the

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

PercentGood is anything less than 100, then the returned row may be incorrect. Quality is returned as uncertain if percent good is not 100 percent.

Now look at the counter values that are returned using OPTIMISTIC quality in the preceding illustration The query skips the value to be returned at the first cycle boundary, because there is not enough information about the cycle prior to that boundary. At the second cycle boundary, the value 0 will be returned, because there was a gap in the data for the entire first cycle. In the second cycle, there are two points, P1 and P2. The query uses P2 as the end value of the cycle and infers a start value of the cycle from P1. At the third cycle boundary, $T_{c2}$, the query returns P2 – P1. Similarly, at the last cycle boundary, the query returns P4 – P3.

For the integral retrieval mode, the query does not summarize data for gaps because there is no way to know which value to use for the summarization. However, if the query specifies OPTIMISTIC quality, the query uses the last known good value for the summarization in the gap. As described for the counter retrieval example, the PercentGood column also expresses the quality of the calculated value in integral retrieval, so if the PercentGood is anything less than 100, then the returned row may be incorrect.

### Quality Rule - Query Examples

To force a query to exclude points with doubtful OPC quality, specify the following in the query:

```
AND wwQualityRule = 'Good'
```

To force a query to use points with both good and doubtful OPC quality, specify the following in the query:

```
AND wwQualityRule = 'Extended'
```

If you include the wwQualityRule column in a SELECT statement, it will show which quality rule was used for the individual row, if applicable.

You can combine OPC qualities in a query. For example, if you combine a mixture of good OPC qualities (such as 192 to 219), a good OPC quality (192) will be returned as a combined result.

```
SELECT TagName, DateTime, Value, QualityDetail, OPCQuality, wwRetrievalMode
   FROM History
          WHERE TagName = 'I0R5'
          AND DateTime >= '2009-09-12 00:20'
          AND DateTime <= '2009-09-12 00:40'
          AND wwResolution = 10000
          AND wwRetrievalMode = 'Avg'
```

If you run this query against the following sample data:

| Tagname | DateTime | Resolution | QualityDetail |
|---|---|---|---|
| I0R5 | 2009-09-12 00:07 | 2 | 193 |
| I0R5 | 2009-09-12 00:14 | 3 | 195 |
| I0R5 | 2009-09-12 00:22 | 0 | 196 |
| I0R5 | 2009-09-12 00:25 | 1 | 199 |
| I0R5 | 2009-09-12 00:27 | 0 | 200 |
| I0R5 | 2009-09-12 00:29 | 2 | 207 |
| I0R5 | 2009-09-12 00:33 | 3 | 215 |
| I0R5 | 2009-09-12 00:36 | 0 | 216 |
| I0R5 | 2009-09-12 00:39 | 1 | 219 |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

The results are:

| Tagname | DateTime | Value | QualityDetail | OPCQuality | wwRetrievalMode |
|---|---|---|---|---|---|
| I0R5 | 2009-09-12 00:20 | 2.6 | 192 | 192 | AVERAGE |
| I0R5 | 2009-09-12 00:30 | 1.0 | 192 | 192 | AVERAGE |
| I0R5 | 2009-09-12 00:40 | 1.6 | 192 | 192 | AVERAGE |

Similarly, if you combine a mixture of doubtful OPC qualities, a doubtful OPC quality (64) will be returned as the combined OPC quality.

```
SELECT TagName, DateTime, Value, QualityDetail, OPCQuality, wwRetrievalMode
   FROM History
          WHERE TagName = 'I0R5'
          AND DateTime >= '2009-09-12 00:20'
          AND DateTime <= '2009-09-12 00:40'
          AND wwResolution = 10000
          AND wwRetrievalMode = 'Integral'
```

If you run this query against the following sample data:

| Tagname | DateTime | Resolution | QualityDetail |
|---|---|---|---|
| I0R5 | 2009-09-12 00:07 | 2 | 65 |
| I0R5 | 2009-09-12 00:14 | 3 | 68 |
| I0R5 | 2009-09-12 00:22 | 0 | 71 |
| I0R5 | 2009-09-12 00:25 | 1 | 74 |
| I0R5 | 2009-09-12 00:27 | 0 | 79 |
| I0R5 | 2009-09-12 00:29 | 2 | 80 |
| I0R5 | 2009-09-12 00:33 | 3 | 88 |
| I0R5 | 2009-09-12 00:36 | 0 | 92 |
| I0R5 | 2009-09-12 00:39 | 1 | 64 |

The results are:

| Tagname | DateTime | Value | QualityDetail | OPCQuality | wwRetrievalMode |
|---|---|---|---|---|---|
| I0R5 | 00:20 | 26.0 | 64 | 64 | INTEGRAL |
| I0R5 | 00:30 | 10.0 | 64 | 64 | INTEGRAL |
| I0R5 | 00:40 | 16.0 | 64 | 64 | INTEGRAL |

When you combine the same OPC quality then that OPC quality will be returned. However, when there is no good point in a cycle for cyclic modes such as Integral, Average, Counter, or AnalogSummary, the returned NULL value will have an OPC quality of 0 and a Quality Detail of 65536, regardless of combined qualities.

```
SELECT TagName, StartDateTime, EndDateTime, OPCQuality, PercentGood, wwRetrievalMode, first
   FROM AnalogSummaryHistory
          WHERE TagName = 'F0R5'
          AND StartDateTime >= '2009-09-12 00:20'
          AND EndDateTime <= '2009-09-12 00:40'
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

```
        AND wwResolution = 10000
        AND wwRetrievalMode = 'Cyclic'
```

If you run this query against the following sample data:

| Tagname | DateTime | Resolution | QualityDetail |
|---|---|---|---|
| F0R5 | 2009-09-12 00:07 | 1.6 | 78 |
| F0R5 | 2009-09-12 00:14 | 3.1 | 78 |
| F0R5 | 2009-09-12 00:22 | 0.2 | 78 |
| F0R5 | 2009-09-12 00:25 | 0.8 | 78 |
| F0R5 | 2009-09-12 00:27 | 0.4 | 78 |
| F0R5 | 2009-09-12 00:29 | 2.2 | 78 |
| F0R5 | 2009-09-12 00:33 | 3.3 | 78 |
| F0R5 | 2009-09-12 00:36 | 0.3 | 78 |
| F0R5 | 2009-09-12 00:39 | 1.2 | 78 |

The results are:

| Tagname | StartDate Time | EndDate Time | OPCQuality | PercentGood | wwRetrievalMode | first |
|---|---|---|---|---|---|---|
| F0R5 | 2009-09-12 00:20 | 2009-09-12 00:30 | 78 | 100 | CYCLIC | 0.200 |
| F0R5 | 2009-09-12 00:30 | 2009-09-12 00:40 | 78 | 100 | CYCLIC | 3.300 |

```
SELECT TagName, DateTime, Value, QualityDetail, OPCQuality, wwRetrievalMode
   FROM History
      WHERE TagName = 'F0R5'
      AND DateTime >= '2009-09-12 00:20'
      AND DateTime <= '2009-09-12 00:40'
      AND wwResolution = 10000
      AND wwRetrievalMode = 'Avg'
```

If you run this query against the following sample data:

| Tagname | DateTime | Resolution | QualityDetail |
|---|---|---|---|
| F0R5 | 2009-09-12 00:07 | 1.6 | 15 |
| F0R5 | 2009-09-12 00:14 | 3.1 | 15 |
| F0R5 | 2009-09-12 00:22 | 0.2 | 15 |
| F0R5 | 2009-09-12 00:25 | 0.8 | 15 |
| F0R5 | 2009-09-12 00:27 | 0.4 | 15 |
| F0R5 | 2009-09-12 00:29 | 2.2 | 15 |
| F0R5 | 2009-09-12 00:33 | 3.3 | 15 |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Tagname | DateTime | Resolution | QualityDetail |
|---|---|---|---|
| F0R5 | 2009-09-12 00:36 | 0.3 | 15 |
| F0R5 | 2009-09-12 00:39 | 1.2 | 15 |

The results are:

| Tagname | DateTime | Value | QualityDetail | OPCQuality | wwRetrievalMode |
|---|---|---|---|---|---|
| F0R5 | 2009-09-12 00:20 | NULL | 65536 | 0 | AVERAGE |
| F0R5 | 2009-09-12 00:30 | NULL | 65536 | 0 | AVERAGE |
| F0R5 | 2009-09-12 00:40 | NULL | 65536 | 0 | AVERAGE |

When you combine a mixture of good, bad, and uncertain OPC qualities, a doubtful OPC quality (64) will be returned as a combined result.

```
SELECT TagName, DateTime, Value, QualityDetail, OPCQuality, wwRetrievalMode
   FROM History
      WHERE TagName = 'F0R5'
      AND DateTime >= '2009-09-12 00:20'
      AND DateTime <= '2009-09-12 00:40'
      AND wwResolution = 10000
      AND wwRetrievalMode = 'Avg'
      AND wwQualityRule = 'Optimistic'
```

If you run this query against the following sample data:

| Tagname | DateTime | Resolution | QualityDetail |
|---|---|---|---|
| F0R5 | 2009-09-12 00:07 | 1.6 | 15 |
| F0R5 | 2009-09-12 00:14 | 3.1 | 69 |
| F0R5 | 2009-09-12 00:22 | 0.2 | 78 |
| F0R5 | 2009-09-12 00:25 | 0.8 | 200 |
| F0R5 | 2009-09-12 00:27 | 0.4 | 15 |
| F0R5 | 2009-09-12 00:29 | 2.2 | 92 |
| F0R5 | 2009-09-12 00:33 | 3.3 | 88 |
| F0R5 | 2009-09-12 00:36 | 0.3 | 199 |
| F0R5 | 2009-09-12 00:39 | 1.2 | 196 |

The results are:

| Tagname | DateTime | Value | QualityDetail | OPCQuality | wwRetrievalMode |
|---|---|---|---|---|---|
| F0R5 | 2009-09-12 00:20 | 2.012 | 64 | 64 | AVERAGE |
| F0R5 | 2009-09-12 00:30 | 0.820 | 64 | 64 | AVERAGE |
| F0R5 | 2009-09-12 00:40 | 1.751 | 64 | 64 | AVERAGE |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

For RoundTrip, StateSummary, and ValueState modes, the OPC qualities are only combined with the same state in a cycle. If the state only occurs once in a cycle, then the qualities of that state will be returned. The returned NULL state will always have an OPC quality of 0 and Quality Detail of 65536. The same qualities are returned for a state that has no roundtrip in RoundTrip mode.

```
SELECT TagName, DateTime, Value, QualityDetail, OPCQuality, StateTime
   FROM History
      WHERE TagName = 'I001'
         AND DateTime >= '2009-09-12 00:20'
         AND DateTime <= '2009-09-12 00:40'
         AND wwResolution = 10000
         AND wwRetrievalMode = 'RoundTrip'
         AND wwStateCalc = 'MaxContained'
```

If you run this query against the following sample data:

| Tagname | DateTime | Resolution | QualityDetail |
|---|---|---|---|
| I001 | 2009-09-12 00:12 | 1 | 90 |
| I001 | 2009-09-12 00:15 | 2 | 65 |
| I001 | 2009-09-12 00:22 | 1 | 85 |
| I001 | 2009-09-12 00:23 | 2 | 75 |
| I001 | 2009-09-12 00:26 | 1 | 75 |
| I001 | 2009-09-12 00:29 | 2 | 70 |

The results are:

| Tagname | DateTime | Value | QualityDetail | OPC-Quality | StateTime |
|---|---|---|---|---|---|
| I001 | 2009-09-12 00:20 | NULL | 65536 | 0 | NULL |
| I001 | 2009-09-12 00:20 | 1.0 | 90 | 90 | NULL |
| I001 | 2009-09-12 00:20 | 2.0 | 65 | 65 | NULL |
| I001 | 2009-09-12 00:20 | 1.0 | 64 | 64 | 4000 |
| I001 | 2009-09-12 00:20 | 2.0 | 64 | 64 | 6000 |

The returned Quality Detail is the same as OPC quality unless there is special flag for certain indication for example when there is indication for role over in counter mode.

```
SELECT TagName, DateTime, Value, QualityDetail, OPCQuality
   FROM History
      WHERE TagName = 'I0R5'
         AND DateTime >= '2009-09-12 00:20'
         AND DateTime <= '2009-09-12 00:40'
         AND wwResolution = 10000
         AND wwRetrievalMode = 'Avg'
```

If you run this query against the following sample data:

| Tagname | DateTime | Resolution | QualityDetail |
|---|---|---|---|
| I0R5 | 2009-09-12 00:07 | 2 | 218 |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Tagname | DateTime | Resolution | QualityDetail |
|---|---|---|---|
| I0R5 | 2009-09-12 00:14 | 3 | 218 |
| I0R5 | 2009-09-12 00:22 | 0 | 218 |
| I0R5 | 2009-09-12 00:25 | 1 | 218 |
| I0R5 | 2009-09-12 00:27 | 0 | 218 |
| I0R5 | 2009-09-12 00:29 | 2 | 218 |
| I0R5 | 2009-09-12 00:33 | 3 | 218 |
| I0R5 | 2009-09-12 00:36 | 0 | 218 |
| I0R5 | 2009-09-12 00:39 | 1 | 218 |

The results are:

| Tagname | DateTime | Value | QualityDetail | OPCQuality |
|---|---|---|---|---|
| I0R5 | 2009-09-12 00:20 | 2.6 | 218 | 218 |
| I0R5 | 2009-09-12 00:30 | 1.0 | 218 | 218 |
| I0R5 | 2009-09-12 00:40 | 1.6 | 218 | 218 |

For Interpolated mode only the returned row with Linear wwInterpolationType will have combined qualities.

```
SELECT TagName, DateTime, Value, QualityDetail, OPCQuality, wwRetrievalMode,
wwInterpolationType
   FROM History
      WHERE TagName = 'I0R5'
         AND DateTime >= '2009-09-12 00:20'
         AND DateTime <= '2009-09-12 00:40'
         AND wwResolution = 10000
         AND wwRetrievalMode = 'Interpolated'
         AND wwInterpolationType = 'Linear'
```

If you run this query against the following sample data:

| Tagname | DateTime | Resolution | QualityDetail |
|---|---|---|---|
| I0R5 | 2009-09-12 00:07 | 2 | 193 |
| I0R5 | 2009-09-12 00:14 | 3 | 195 |
| I0R5 | 2009-09-12 00:22 | 0 | 196 |
| I0R5 | 2009-09-12 00:25 | 1 | 199 |
| I0R5 | 2009-09-12 00:27 | 0 | 200 |
| I0R5 | 2009-09-12 00:29 | 2 | 207 |
| I0R5 | 2009-09-12 00:33 | 3 | 215 |
| I0R5 | 2009-09-12 00:36 | 0 | 216 |
| I0R5 | 2009-09-12 00:39 | 1 | 219 |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

The results are:

| Tagname | DateTime | Value | QualityDetail | OPCQuality |
|---|---|---|---|---|
| I0R5 | 2009-09-12 00:20 | 0.8 | 192 | 192 |
| I0R5 | 2009-09-12 00:30 | 2.3 | 192 | 192 |
| I0R5 | 2009-09-12 00:40 | 1.0 | 192 | 219 |

**Note:** Cyclic, Full, Delta, Maximum, Minimum, and BestFit do not have combined qualities; therefore, the rules are not applied to these modes.

### State Calculation (wwStateCalc)

The state calculation setting applies to ValueState and RoundTrip retrieval.

For ValueState retrieval, you can choose the type of state calculation (aggregation) to be performed on the data:

- **Minimum:** The shortest amount of time that the tag has been in each unique state.
- **Maximum:** The longest amount of time that the tag has been in each unique state.
- **Average:** The average amount of time that the tag has been in each unique state.
- **Total:** The total amount of time that the tag has been in each unique state.
- **Percent:** The total percentage of time that the tag has been in each unique state.
- **MinContained**: The shortest amount of time each tag has been in each unique state for each cycle, disregarding the occurrences that are not fully contained with the calculation cycle.
- **MaxContained**: The longest amount of time that the tag has been in each unique state for each cycle, disregarding the occurrences that are not fully contained with the calculation cycle.
- **AvgContained**: The average amount of time that the tag has been in each unique state for each cycle, disregarding the occurrences that are not fully contained with the calculation cycle.
- **TotalContained**: The total amount of time that the tag has been in each unique state for each cycle, disregarding the occurrences that are not fully contained with the calculation cycle.
- **PercentContained**: The percentage of time that the tag has been in each unique state for each cycle, disregarding the occurrences that are not fully contained with the calculation cycle.

All results except Percent are in milliseconds. Percent is a percentage typically between 0.0 and 100.0. The percentage can be higher than 100 in certain circumstances.

The nature of the data and how you set the cycle count determines whether you should use a "contained" version of the aggregation. The calculations apply to each unique value state that the tag was in during each retrieval cycle for the query. The total and percent calculations are always exact, but the minimum, maximum, and average calculations are subject to "arbitrary" cycle boundaries that do not coincide with the value changes. Therefore, non-intuitive results may be returned. This is most apparent for slowly-changing tags queried over long cycles.

For example, a string tag that assumes only two distinct values changing every 10 minutes is queried with a cycle time of two hours. Going into a cycle, the value (state) at the cycle boundary is recorded. If the value then changes a short while into the cycle, the state found at the cycle start time will most likely end up being the minimum value. Likewise, the state at the cycle end time is cut short at the cycle end time. The two cut-off occurrences in turn skew the average calculation.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

For RoundTrip retrieval, you can only specify the following types of state calculations (aggregations) to be performed on the data. The calculations are for each unique state within each retrieval cycle for the query.

- **MinContained**. The shortest time span between consecutive leading edges of any state that occurs multiple times within the cycle, while disregarding state occurrences that are not fully contained inside of the cycle.
- **MaxContained**. The longest time span between consecutive leading edges of any state that occurs multiple times within the cycle, while disregarding state occurrences that are not fully contained inside of the cycle.
- **AvgContained**. The average time span between consecutive leading edges of any state that occurs multiple times within the cycle, while disregarding state occurrences that are not fully contained inside of the cycle. (This is the default.)
- **TotalContained**. The total time span between consecutive leading edges of any state that occurs multiple times within the cycle while disregarding state occurrences that are not fully contained inside of the cycle.
- **PercentContained**. The percentage of the cycle time spent in time span between consecutive leading edges for a state that occurs multiple times within the cycle while disregarding value occurrences that are not fully contained inside of the cycle.

### Analog Value Filtering (wwFilter)

**You can use the following analog filters for all retrieval modes:**

- Statistical removal of outliers
- Analog to discrete conversion
- Zero around a base value

These filters are applied in a query to retrieve data from the History table, WideHistory table, or StateWideHistory table. These filter only apply to analog tags. All other types of tags, including analog summary tags, are not supported.

You need to specify a filter name in the virtual column wwFilter, with or without an override, to the set of parameters that are defined for the specified filter. The filters are specified as C-like functions: parentheses are always required, even when you choose not to override the default parameters by passing no parameters.

The default value for the wwFilter column is ‘NoFilter’. If the query does not specify the wwFilter element at all, or if its default value is not overridden, then no filter is applied.

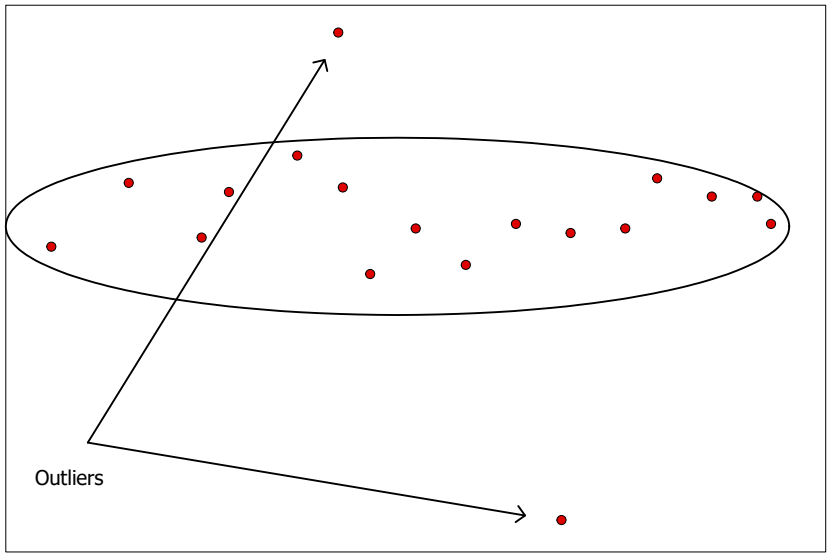
When you use the analog filters in a query that uses wwQualityRule, wwQualityRule is applied first and wwFilter is applied later. You can only use one filter per query.

#### Statistically Removing Outliers (SigmaLimit)

This analog filter removes outliers from a set of analog points based on the assumption that the distribution of point values in the set is a normal distribution.

The following illustration shows an example of outliers.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




You can filter outliers by specifying a filter called ‘SigmaLimit()’. This filter has one parameter defined for specifying the value of n. This parameter is of type double. If the parameter is omitted, then a default parameter of 2.0 is used.

When this filter is specified in any retrieval mode, a time weighted mean, ì (mu), and time weighted standard deviation, ó (sigma), are found for each analog tag for the entire query range including phantom cycles if any, and points falling outside of the range [ì - nó, ì + nó] are removed from the point set before the points are processed further. In other words, the value will be filtered out if value > ì + nó or value < ì – nó.

Time weighted standard deviation is calculated as:

Math.Sqrt( (integralOfSquares - 2 * timeWeightedAverage * integral + totalTime * timeWeightedAverage * timeWeightedAverage)/totalTime);

This is the single pass equivalent to the formula:

$$s^2_{weighted} = \sum_{i=1}^{N} W_i(X_i - \mu^*)^2$$

Ranges where the value is NULL are excluded from these calculations.

A cyclic query example using a ‘SigmaLimit()’ filter without specifying the n value would look like this:

```
SELECT DateTime, Value, wwFilter
   FROM History
      WHERE TagName = ('TankLevel')
         AND DateTime >= '2008-01-15 15:00:00'
         AND DateTime <= '2008-01-15 17:00:00'
         AND wwRetrievalMode = 'Cyclic'
         AND wwFilter = 'SigmaLimit()'
```

Not specifying the n-value as done here is the same as specifying ‘SigmaLimit(2)’. The result set might look like this:

```
DateTime                      Value       wwFilter

2008-01-15 15:00:00.000       34.56       SigmaLimit()
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

```
DateTime                        Value       wwFilter
2008-01-15 16:00:00.000         78.90       SigmaLimit()
2008-01-15 17:00:00.000         12.34       SigmaLimit()
```

If the first value would be filtered out by the SigmaLimit filter, the value will be replaced with the time weighted mean.

### Converting Analog Values to Discrete Values (ToDiscrete)

The analog to discrete conversion filter allows you to convert value streams for any analog tag in the query tag list into discrete value streams. The filter can be used with all the retrieval modes.

To convert analog values to discrete values, specify the ToDiscrete() filter in the wwFilter column. This filter has two parameters:

| Parameter | Valid Values | Default Value |
|---|---|---|
| CutoffValue | any double value | 0.0 |
| Operator | >, >=, or <= | > |

The following are supported syntaxes.

- ToDiscrete()
- ToDiscrete(2)
- ToDiscrete(2, >=)

The following are unsupported syntaxes.

- ToDiscrete(2,)
- ToDiscrete(, >=)
- ToDiscrete(>=)

The cutoff value holds the value that signifies the boundary between values that are to be interpreted as OFF and values that are to be interpreted as ON.

The operator parameter controls the value range relative to the cutoff value to convert to the ON value and vice versa.

NULLs encountered in the analog value stream are copied unchanged to the discrete value stream. The quality of each discrete point is copied from the analog point that causes its production. However, the quality detail for values modified with this filter will have the QualityDetail flag 0x2000 (value changed by filter) set. For example, consider the following ValueState query:

```
SELECT DateTime, vValue, StateTime, wwFilter
   FROM History
      WHERE TagName IN ('SysTimeSec')
         AND DateTime >= '2008-01-15 15:00:00'
         AND DateTime <= '2008-01-15 17:00:00'
         AND wwRetrievalMode = 'ValueState'
         AND wwStateCalc = 'MinContained'
         AND wwResolution = 7200000
         AND wwFilter = 'ToDiscrete(29, >)'
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

Here the operator is specified as >, so values greater than but not including 29 are internally converted to ON, whereas values from 0 to 29 are converted to OFF. This query could return the following rows:

| DateTime | vValue | StateTime | wwFilter |
|---|---|---|---|
| 2008-01-15 15:00:00.000 | 0 | 30000 | ToDiscrete(29, >) |
| 2008-01-15 15:00:00.000 | 1 | 30000 | ToDiscrete(29, >) |
| 2008-01-15 17:00:00.000 | 0 | 30000 | ToDiscrete(29, >) |
| 2008-01-15 17:00:00.000 | 1 | 30000 | ToDiscrete(29, >) |

The values returned in the StateTime column show that the shortest amount of time that SysTimeSec had values equivalent to either ON or OFF and remained in that state was 30 seconds. A similar RoundTrip query would look like this:

```
SELECT DateTime, vValue, StateTime, wwFilter
   FROM History
      WHERE TagName IN ('SysTimeSec')
         AND DateTime >= '2008-01-15 15:00:00'
         AND DateTime <= '2008-01-15 17:00:00'
         AND wwRetrievalMode = 'RoundTrip'
         AND wwStateCalc = 'MaxContained'
         AND wwResolution = 7200000
         AND wwFilter = 'ToDiscrete(29, <=)'
```

Here the operator is specified as <=, so the resulting conversion is exactly opposite to that performed in the previous query. Now values smaller than or equal to 29 are internally converted to ON, whereas values from 30 to 59 are converted to OFF. This query could return the following rows:

| DateTime | vValue | StateTime | wwFilter |
|---|---|---|---|
| 2008-01-15 15:00:00.000 | 0 | 60000 | ToDiscrete(29, <=) |
| 2008-01-15 15:00:00.000 | 1 | 60000 | ToDiscrete(29, <=) |
| 2008-01-15 17:00:00.000 | 0 | 60000 | ToDiscrete(29, <=) |
| 2008-01-15 17:00:00.000 | 1 | 60000 | ToDiscrete(29, <=) |

The values returned in the StateTime column now show that the longest amount of time found between roundtrips for both the OFF and the ON state within the 2-hour cycles was 60 seconds.

Using the ToDiscrete() filter is similar to using edge detection for event tags. Edge detection returns the actual value with a timestamp in history for when a value matched a certain criteria. The ToDiscrete() filter returns either a 1 or 0 to show that the criteria threshold was crossed. The ToDiscrete() filter is more flexible, however, in the following ways:

- You can use it with delta and full retrieval.
- You can combine it with "time-in-state" calculations to determine how long a value is above a certain threshold or the duration between threshold times.

Use the ToDiscrete() filter if you are mostly interested in when something occurred, and not necessarily the exact value of the event.

For more information on edge detection, see Edge Detection for Events (wwEdgeDetection).

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### "Zeroing" around a Base Value (SnapTo)

This analog filter lets you force values in a well-defined range around one or more base values to "snap to" that base value. For example, you can use this filter when a tank is known to be empty, but the tag that stores the tank level returns a "noisy" value close to zero.

The filter can be used with all retrieval modes, but its main benefits are in the aggregate retrieval modes: average, integral, minimum, and maximum.

To zero values around the base value, specify the SnapTo() filter in the wwFilter column of the query.

The syntax for this filter is:

```
SnapTo([tolerance[,base_value_1[, base_value_2]…]])
```

This filter has two parameters:

| Parameter | Valid Values | Default Value |
|---|---|---|
| Tolerance | any double value | 0.01 |
| BaseValue | zero, one, or up to 100 comma-separated double values | single base value of 0.0 |

The following are supported syntaxes.

- SnapTo() – Same as SnapTo(0.01, 0.0)
- SnapTo(3.7) – Same as SnapTo(3.7, 0.0)
- SnapTo(3,) – Syntax Error
- SnapTo(,0) – Syntax error
- SnapTo(,) – Syntax error
- SnapTo(3, 4, -5) – Tolerance=3, Base Values 4 and -5.

When the Snap to filter is specified, point values falling inside any of the ranges [Base value – Tolerance, Base value + Tolerance] will be forced to the base value before the point goes into further retrieval processing. The result is undefined if the base value +/- tolerance exceeds the range of the double data type. The range is calculated using this expression:

```
If (x <= Base value + Tolerance AND x >= Base value – Tolerance)
x = Base value
```

where x is the value of the point then

If ranges overlap, the first matching base value will be used.

A query example from the History table looks like this:

```
SELECT DateTime, Value, wwFilter
   FROM History
      WHERE TagName = ('TankLevel')
         AND DateTime >= '2008-01-15 15:00:00'
         AND DateTime <= '2008-01-15 17:00:00'
         AND wwRetrievalMode = 'Average'
         AND wwResolution = 3600000
         AND wwFilter = 'SnapTo(0.01, 0, 1000)'
```

The following rows might be returned:

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

```
DateTime                    Value       wwFilter
2008-01-15 15:00:00.000     0           SnapTo(0.01, 0, 1000)
2008-01-15 16:00:00.000     875.66      SnapTo(0.01, 0, 1000)
2008-01-15 17:00:00.000     502.3       SnapTo(0.01, 0, 1000)
```

When a value is snapped, the QualityDetail bit flag 0x2000 is set.

If the filter syntax is not correct, a syntax error is returned and no rows are returned.

### Selecting Values for Analog Summary Tags (wwValueSelector)

For an analog summary tag, multiple summarized values can be stored in the Historian for a single summarization period. When you query analog summary data, a single value, time, and quality (VTQ) must first be extrapolated from the summarized values.

You set the value selector in the query to specify which summarized value to return. The possible values are as follows:

| Value Selector Setting | Value Returned | Timestamp Returned |
|---|---|---|
| AUTO | The retrieval mode determines the value. See the following table for how AUTO applies to the value selection. This is the default value. | The retrieval mode determines the timestamp. See the following table for how AUTO applies to the value selection. This is the default value. |
| FIRST | The first value that occurs within the summary period. | The actual timestamp of the first value occurrence within the summary period. |
| LAST | The last value that occurs within the summary period. | The actual timestamp of the last value occurrence within the summary period. |
| MIN or MINIMUM | The first minimum value that occurs within the summary period. | The actual timestamp of the first minimum value occurrence within the summary period. |
| MAX or MAXIMUM | The first maximum value that occurs within the summary period. | The actual timestamp of the first maximum value occurrence within the summary period. |
| AVG or AVERAGE | A time-weighted average calculated from values within the summary period. | The summary period start time. |
| INTEGRAL | An integral value calculated from values within the summary period. | The summary period start time. |
| STDDEV or STANDARDDEVIATION | A standard deviation calculated from values within the summary period. | The summary period start time. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

The following table describes the value to be considered if the value selector is set to AUTO:

| Retrieval Mode | Analog Summary Behavior |
|---|---|
| Cyclic | The last value within the summary period is used. The actual timestamp of the last value occurrance within the summary period is used. |
| Delta | The last value within the summary period is used. The actual timestamp of the last value occurrance within the summary period is used. |
| Full | The last value within the summary period is used. The actual timestamp of the last value occurrance within the summary period is used. |
| Interpolated | The retrieval mode determines the appropriate value to return. See the following table for how AUTO applies to the value selection. This is the default value. |
| Best Fit | The first, last, min, and max points from analog summaries are all considered as analog input points. Best fit analysis is done with these points. If the analog summary percentage good is not 100%, the cycle is considered to have a NULL. |
| Average | The averages of analog summaries are calculated using the values from the Average column of the AnalogSummaryHistory table. Interpolation type is ignored for analog summary values, and STAIRSTEP interpolation is always used. PercentGood is calculated by considering the TimeGood of each analog summary.<br><br>If cycle boundaries do not exactly match the summary periods of the stored analog summaries, the averages and time good are calculated by prorating the average and time good values for the portion of the time the summary period overlaps with the cycle. Quality will be set to 64 (uncertain) if cycle boundaries do not match summary periods.<br><br>If the QualityDetail of any analog summary considered for a cycle is uncertain (64), the resulting quality is set to 64. |
| Minimum | The first minimum value within the summary period is used. The actual timestamp of the first minimum value occurrance within the summary period is used. |
| Maximum | The first maximum value within the summary period is used. The actual timestamp of the first maximum value occurrance within the summary period is used. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Retrieval Mode | Analog Summary Behavior |
|---|---|
| Integral | The integrals of analog summaries are calculated using the Integral column of the AnalogSummaryHistory table. Interpolation type is ignored for analog summary values, and STAIRSTEP interpolation is always used. PercentGood is calculated by considering the TimeGood of each analog summary.<br><br>If cycle boundaries do not exactly match the summary periods of the stored analog summaries, the integrals and time good are calculated by prorating the integral and time good values for the portion of the time the summary period overlaps with the cycle. Quality is set to 64 (uncertain) if cycle boundaries do not match summary periods.<br><br>If the QualityDetail of any analog summary considered for a cycle is uncertain (64), the resulting quality will be set to 64. |
| Slope | The last value within the summary period is used. The actual timestamp of the last value occurrance within the summary period is used. |
| ValueState | Cannot be used with analog summary data. No values are returned. |
| Counter | Cannot be used with analog summary data. No values are returned. |
| RoundTrip | Cannot be used with analog summary data. No values are returned. |

For an analog summary tag, if any of the data within a summary period has an OPCQuality other than Good, the OPCQuality returned will be Uncertain. This is true even for summary values that are not calculated, such as first, last, minimum, maximum, and so on. For example, if the OPCQuality for a last value is actually Good, but there was a I/O Server disconnect during the summary calculation period, the OPCQuality for the last value is returned as Uncertain. A QualityDetail of 202 is used to distinguish between the original point and the latest point.

### Edge Detection for Events (wwEdgeDetection)

An event is the moment at which a detection criterion is met on historical tag values in the Historian. At a basic level, anything that can be determined by looking at stored data can be used as an event.

When detecting events, it is useful to pinpoint rows in a result set where the satisfaction of criteria in a WHERE clause changed from true to false, or vice versa. For example, you may want to know when the level of a tank went above 5 feet. The WHERE clause in a query for this example might be TANKLEVEL > 5. As the tank level approaches 5 feet, the criterion does not return true. Only when the level crosses the line from not satisfying the criterion to satisfying it, does the event actually occur. This imaginary "line" where the change occurs is called the *edge*.

Over a period of time, there may be many instances where the criteria cross the "edge" from being satisfied to not satisfied, and vice-versa. The values on either side of this "edge" can be detected if you configure your event tag to include this information. There are four possible options for edge detection: *none, leading, trailing,* or *both*. You will get differing results based on which option you use:

| Option | Results |
|---|---|
| None | Returns all rows that successfully meet the criteria; no edge detection is implemented at the specified resolution. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Option | Results |
|---|---|
| Leading | Returns only rows that are the first to successfully meet the criteria (return true) after a row did not successfully meet the criteria (returned false). |
| Trailing | Returns only rows that are the first to fail the criteria (return false) after a row successfully met the criteria (returned true). |
| Both | All rows satisfying both the leading and trailing conditions are returned. |

Edge detection only applies to analog and discrete value detectors. Also, edge detection is handled slightly differently based on whether you are using analog tags or discrete tags.

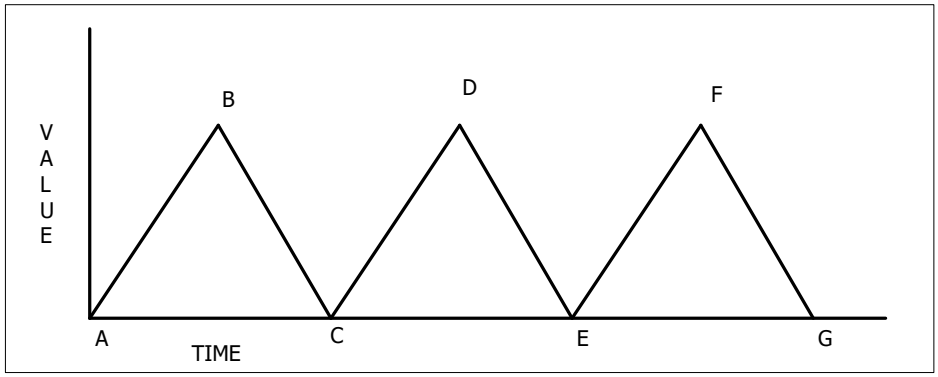
For more information, see the following topics:

- Edge Detection for Analog Tags
- Edge Detection for Discrete Tags

You can also use the ToDiscrete() query filter to determine when data values cross a particular threshold. For more information, see Converting Analog Values to Discrete Values (ToDiscrete).

### Edge Detection for Analog Tags

For example, the behavior of the WHERE clause as it processes a result set can be illustrated as:




Slopes A-B, C-D and E-F are rising edges, while slopes B-C, D-E and F-G are falling edges. The slopes are affected by the WHERE clause, which is a combination of the wwEdgeDetection option and the comparison operator used against the value.

The following table describes the rows that would be returned for the various edge detection settings:

| **Operator** | **=** | **<** | **>** | **<=** | **>=** |
|---|---|---|---|---|---|
| **Leading** | Falling and rising edges; first value that meets the criteria. | Falling edge only; first value to meet the criteria.* | Rising edge only; first value to meet the criteria. | Falling edge only; first value to meet the criteria. * | Rising edge only; first value to meet the criteria. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Operator | = | < | > | <= | >= |
|---|---|---|---|---|---|
| **Trailing** | Falling and rising edges; first value to fail the criteria after a value meets the criteria. | Rising edge only; equal to the first value to fail the criteria. | Falling edge only; first value to fail the criteria.* | Rising edge only; first value to fail the criteria. | Falling edge only; first value to fail the criteria.* |

* If the falling edge is a vertical edge with no slope, the query will return the lowest value of that edge.

The following query selects all values of "SysTimeSec" that are greater than or equal to 50 from the History table between 10:00 and 10:02 a.m. on December 2, 2001. No edge detection is specified.

```
SELECT DateTime, Value
   FROM History
      WHERE TagName = 'SysTimeSec'
         AND DateTime >= '2001-12-02 10:00:00'
         AND DateTime <= '2001-12-02 10:02:00'
         AND wwRetrievalMode = 'Cyclic'
         AND wwResolution = 2000
         AND Value >= 50
         AND wwEdgeDetection = 'None'
```

The results are:

```
DateTime                        Value

2001-12-02 10:00:50.000         50

2001-12-02 10:00:52.000         52

2001-12-02 10:00:54.000         54

2001-12-02 10:00:56.000         56

2001-12-02 10:00:58.000         58

2001-12-02 10:01:50.000         50

2001-12-02 10:01:52.000         52

2001-12-02 10:01:54.000         54

2001-12-02 10:01:56.000         56

2001-12-02 10:01:58.000         58
```

### Leading Edge Detection for Analog Tags

If *Leading* is specified as the parameter in the edge detection time domain extension, the only rows in the result set are those that are the first to successfully meet the WHERE clause criteria (returned true) after a row did not successfully meet the WHERE clause criteria (returned false).

The following query selects the first values of "SysTimeSec" from the History table to meet the Value criterion between 10:00 and 10:02 a.m. on December 2, 2001.

```
SELECT DateTime, Value
   FROM History
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

```
      WHERE TagName = 'SysTimeSec'
         AND DateTime >= '2001-12-02 10:00:00'
         AND DateTime <= '2001-12-02 10:02:00'
         AND wwRetrievalMode = 'Cyclic'
         AND wwResolution = 2000
         AND Value >= 50
         AND wwEdgeDetection = 'Leading'
```

The query will return only the two values that were greater than or equal to 50 for the time period specified:

```
DateTime                      Value

2001-12-02 10:00:50.000       50

2001-12-02 10:01:50.000       50
```

Compare these results with the same query using no edge detection, as shown in Edge Detection for Analog Tags. Notice that even though the original query returned ten rows, the edge detection only returns the first row recorded after the event criteria returned true.

### Trailing Edge Detection for Analog Tags

If *Trailing* is specified as the parameter in the edge detection extension, the only rows in the result set are those that are the first to fail the criteria in the WHERE clause (returned false) after a row successfully met the WHERE clause criteria (returned true).

The following query selects the first values of "SysTimeSec" from the History table to fail the Value criterion between 10:00 and 10:02 a.m. on December 2, 2001.

```
SELECT DateTime, Value
   FROM History
      WHERE TagName = 'SysTimeSec'
         AND DateTime >= '2001-12-02 10:00:00'
         AND DateTime <= '2001-12-02 10:02:00'
         AND wwRetrievalMode = 'Cyclic'
         AND wwResolution = 2000
         AND Value >= 50
         AND wwEdgeDetection = 'Trailing'
```

The query returns only the two values that were the first to fail the criteria in the WHERE clause for the time period specified:

```
DateTime                      Value

2001-12-02 10:01:00.000       0

2001-12-02 10:02:00.000       0
```

Compare these results with the same query using no edge detection, as shown in Edge Detection for Analog Tags. Notice that even though the original query returned ten recorded rows for each value, the edge detection only returns the first row recorded after the event criteria returned false.

### Both Leading and Trailing Edge Detection for Analog Tags

If Both is specified as the parameter in the edge detection extension, all rows satisfying both the leading and trailing conditions are returned.

The following query selects values of "SysTimeSec" from the History table that meet both the Leading and Trailing criteria between 10:00 and 10:02 a.m. on December 2, 2001.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

```
SELECT DateTime, Value
   FROM History
      WHERE TagName = 'SysTimeSec'
         AND DateTime >= '2001-12-02 10:00:00'
         AND DateTime <= '2001-12-02 10:02:00'
         AND wwRetrievalMode = 'Cyclic'
         AND wwResolution = 2000
         AND Value >= 50
         AND wwEdgeDetection = 'Both'
```

The results are:

```
DateTime                    Value

2001-12-02 10:00:50.000     50

2001-12-02 10:01:00.000     0

2001-12-02 10:01:50.000     50

2001-12-02 10:02:00.000     0
```

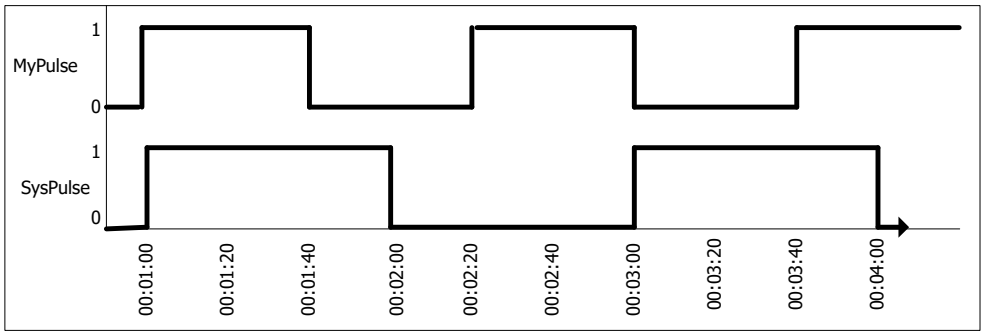
Compare these results with the same query using no edge detection, as shown in Edge Detection for Analog Tags. Notice that value of the first row in the original query is returned in the result set.

### Edge Detection for Discrete Tags

Edge detection for discrete tags operates differently than for analog tags. For example, assume the following discrete tags are stored.

| Tag | Description |
|---|---|
| SysPulse | Transitions between 1 and 0 every minute. |
| MyPulse | Transitions between 1 and 0 every 40 seconds. |

A representation of the data stored in the system is as follows:




The following queries select values of "SysPulse" and "MyPulse" that have a value of 1 (On) from the History and WideHistory tables between 12:59 and 1:04 a.m. on December 8, 2001. No edge detection is specified.

### Leading Edge Detection for Discrete Tags

If Leading is specified as the parameter in the edge detection time domain extension, the only rows in the result set are those that are the first to successfully meet the WHERE clause criteria (returned true) after a row did not successfully meet the WHERE clause criteria (returned false).

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

The following queries select values of "SysPulse" and "MyPulse" that have a value of 1 (On) from the History and WideHistory tables between 12:59 and 1:04 a.m. on December 8, 2001.

### Trailing Edge Detection for Discrete Tags

If Trailing is specified as the parameter in the edge detection extension, the only rows in the result set are those that are the first to fail the criteria in the WHERE clause (returned false) after a row successfully met the WHERE clause criteria (returned true).

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Retrieval Styles for Trend

The Trend application allows you to use "retrieval styles" that automatically switch retrieval modes for trend tags based on the trend duration and/or tag type. For example, you could configure a style that uses delta retrieval for short time periods and best-fit retrieval for longer periods. This helps you to balance response speed and accuracy. Also, retrieval styles allow you to calculate moving averages and retrieve data from the Historian's summary tables.

## Working with Retrieval Styles

Retrieval styles cover the following retrieval options:

- Retrieval mode
- Resolution for cycle-based modes (as time duration or number of pixels per cycle)
- Data retrieval source (history or summary tables)
- Moving average calculation
- State calculation for ValueState retrieval

If you want to use additional retrieval options, such as deadbands, row limits or a quality rule, you must specify them in the Trend application at the application and/or tag level. For more information, see Configuring Retrieval Options and Configuring Trend Options for a Tag.

You can use retrieval styles at the application and/or tag level. When you specify a retrieval style at the application level, that style is used for all tags that do not have a different style specified.

The Trend application comes with various predefined styles that you can use. For a description of each style, see Using the Standard Retrieval Styles. Alternatively, you can define your own retrieval styles to suit your needs. For more information, see Location and Structure of Retrieval Styles and Creating and Editing Retrieval Styles.

### Location and Structure of Retrieval Styles

Retrieval styles are stored at the application level in the following XML file:

`C:\ProgramData\ArchestrA\ActiveFactory\Trend\RetrievalStyles.xml`

After you add or edit a style in this file, it is available to all users of the Trend application on the system. You can edit the file in any text or XML editor. Note the following requirements:

- You must save the file in UTF-8 encoding.
- Names and values are case-sensitive. If any name or value is misspelled, the Trend application may hang on startup.

### Structure of the Retrieval Styles File

The retrieval styles file has the following structure:

```
XML header
Style collection
   Retrieval style 1
      Style names for different locales
      Duration range 1
         Retrieval type 1
         ...
         Retrieval type n
      Duration range 2
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

```
      ...
      Duration range n
   Retrieval style 2
   ...
   Retrieval style n
End of style collection
```

That is:

- The file contains exactly one style collection, represented by the `styleCollection` XML element. For more information, see styleCollection XML Element.
- The style collection contains one or more retrieval styles, represented by the `retrievalStyle` XML element. Each of these represents a style that is available for use in the Trend application. For more information, see retrievalStyle XML Element.
- Each retrieval style contains one or more duration ranges, represented by the `duration` XML element. A duration range defines the retrieval types that are to be used for trend queries whose duration is within a specified range. Duration ranges should be arranged in descending length. For more information, see duration XML Element.
- Each duration range contains one or more retrieval types, represented by the `retrieval` XML element. The retrieval type defines the retrieval options that are to be used for tags of a certain type. For more information, see retrieval XML Element.

The retrieval type that gets used for a given tag is determined as follows:

1. You select a retrieval style in the Trend application.
2. The Trend application searches that retrieval style for a duration range that covers the duration of your trend. This would be the first duration range with a time period that is shorter than the trend duration.
3. When it has found a suitable duration range, it searches that duration range for a retrieval type that suits the type of the tag.

A simple example file might look like this:

```
<?xml version="1.0" encoding="utf-8" ?>
<styleCollection version="9.2" xmlns="urn:retrievalstyle-schema">
   <retrievalStyle server="InSQL" minVersion="8.0" maxVersion="9.0" enabled="true">
      <styleName locale="en">My style</styleName>
      <styleName locale="ja">My style in Japanese</styleName>
      <styleName locale="zh-CN">My style in Chinese</styleName>
      <styleName locale="de">My style in German</styleName>
      <styleName locale="fr">My style in French</styleName>
      <duration minSpan="P0Y0M1DT0H0M0S">
         <retrieval tagType="Discrete" source="History" retrievalMode="Delta"
         stateCalc="*" resolution="0" pixels="0" movingAverageValues="0" />
         <retrieval tagType="All" source="History" retrievalMode="Cyclic" stateCalc="*"
         resolution="0" pixels="5" movingAverageValues="0" />
      </duration>
      <duration minSpan="P0Y0M0DT0H0M0S">
         <retrieval tagType="All" source="History" retrievalMode="Delta" stateCalc="*"
         resolution="0" pixels="0" movingAverageValues="0" />
      </duration>
   </retrievalStyle>
</styleCollection>
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

In this case, the file only defines one style named `My style`. When querying two days of data for a discrete tag using this style, delta retrieval is used (the first `retrieval` element in the first `duration` element). For an analog tag, cyclic retrieval with one cycle for every five pixels of the trend width is used instead (the second `retrieval` element in the first `duration` element). For queries that are shorter than one day, delta retrieval is used regardless of the tag type (the only `retrieval` element in the second `duration` element).

### Creating and Editing Retrieval Styles

To create or edit retrieval styles, you edit the retrieval styles file in a text or XML editor. Read Location and Structure of Retrieval Styles first to get an overview of how this file is structured.

The following procedure provides you the basic steps to add a new style. For details on each XML element, refer to the corresponding subsection.

**To create a new style:**

1. Under the `styleCollection` element, add a `retrievalStyle` element.
2. Under the `retrievalStyle` element, add a `styleName` elements for each locale in which you want to use the style. For more information, see retrievalStyle XML Element.
3. Decide at which trend durations you want to switch retrieval options. Under your `retrievalStyle` element, add `duration` elements for each of these "switching points." For more information, see duration XML Element.
4. For each `duration` element, add `retrieval` elements as needed to define retrieval types. For more information, see retrieval XML Element.

### Retrieval Style XML Elements

The following sections describe each of the XML elements in the retrieval styles file. For information on how they fit together, see Location and Structure of Retrieval Styles.

#### styleCollection XML Element

The `styleCollection` element represents a collection of retrieval styles. It is the container for multiple retrieval styles represented by `retrievalStyle` elements. It has two required attributes:

- `version`: Specifies the format version of the style collection. The only valid value is `9.2`.
- `xmlns`: Specifies the XML namespace to be used. Set this attribute to `urn:retrievalstyle-schema`.

The retrieval styles file can only contain single `styleCollection` element.

#### retrievalStyle XML Element

The `retrievalStyle` element represents single retrieval style. It is the container for two other elements:

- `styleName`: Specifies the name of the style for the locale specified by the `locale` attribute. This is the name by which you can access the style when the Trend application runs under the specified locale.

  You can specify the locale as a two-character ISO language code or a four-character combination of language code and country code. If you specify a name for a two-character locale, it is used for all sub-locales that do not have a separate name defined. For example, if you specify a name for the `de` locale, it is used for the `de-DE`, `de-AT` and `de-CH` locales unless you specify separate names for those locales.

  You must specify a `styleName` element for all styles that you want to use in a given locale. If a style does not have a name defined for a locale, the Trend application does not show it when running under that locale. The only exception is when you run the Trend application under a locale for which no style names are defined at all. In that case, the styles are shown with their names for the `en` locale.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- `duration`: Specifies a duration range. For more information, see duration XML Element.

It has three required attributes:

- `server`: Specifies the server type for which the style can be used. Always set this attribute to `InSQL`.
- `minVersion`: The minimum Historian version that the retrieval style can work with, either `8.0` or `9.0`. If the Trend application is connected to a Historian whose version is lower than the version specified here, the style is not used.

  Specify `9.0` if your style uses functionality that is not supported for AVEVA Historian 8.0.
- `enabled`: Specifies whether the style is active. To temporarily disable the style, set this attribute to `false`.

It has one optional attribute:

- `maxVersion`: The maximum Historian version against which the retrieval style can be used. This attribute is not currently used.

### duration XML Element

The `duration` element represents a duration range. It contains the retrieval types that are used when the trend period is longer than the time period it specifies.

A retrieval style can contain any number of `duration` elements. However, you should arrange these elements in descending length. This is because the Trend application uses the first suitable duration range that it finds, that is, the first duration range with a time period shorter than the current trend period.

For example, assume you have three duration ranges defined in the following order:

- 1 day
- 4 hours
- 0 seconds

For a query with a duration of 2 days, the Trend application uses the retrieval types defined for the "1 day" duration range because it is the first range whose time period is shorter than 2 days. Now assume the same duration ranges are ordered like this:

- 4 hours
- 1 day
- 0 seconds

In this case, the Trend application uses the retrieval types defined for the "4 hours" duration range because again, it is the first range whose time period is shorter than 2 days. The more suitable "1 day" duration range is ignored.

---

**Note:** You should always define a duration range with a time period of 0 seconds. This serves as a "catch-all" for trend periods that aren’t covered by any other duration range.

---

The `duration` element has one required attribute:

- `minSpan`: Specifies the time period as a standard XML duration value, for example, `P0Y0M1DT0H0M0S`. The number to the left of `Y` represents the number of years, the number to the left of `M` represents the number of months, and so on (`D` = days, `H` = hours, `M` = minutes, `S` = seconds). `P` and `T` are separator characters.

It is the container for one other element:

- `retrieval`: Specifies a retrieval type. For more information, see retrieval XML Element.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### retrieval XML Element

The `retrieval` element represents a retrieval type, that is, a set of retrieval options for a certain type of tag.

You can have multiple `retrieval` elements in a duration range. However, you should order them from the most specific to the least specific one. This is because the Trend application uses the first suitable retrieval type that it finds, that is, the first retrieval type with a matching tag type and available history source.

For example, assume that you have three retrieval types defined in the following order:

- Analog tags, Summary data
- Analog tags, History data
- All tags, History data

For an analog tag, the Trend application first tries to retrieve summary data according to the first retrieval type. If no summary data is available, it retrieves history data according to the second retrieval type. Now assume the retrieval types are ordered like this:

- Analog tags, History data
- Analog tags, Summary data
- All tags, History data

In this case, the Trend application never tries to retrieve summary data for an analog tag; it never considers the second retrieval type because it has already found a suitable retrieval type in the first one.

---

You should always define a retrieval type with a tag type of "All" and a history source of "History." This serves as a "catch-all" for tags that aren’t covered by any other retrieval style.

---

The `retrieval` element has seven required attributes:

- `tagType`: Specifies the tag type for which the retrieval type should be used. Valid values are `All`, `Analog`, `Discrete`, and `String`.
- `source`: Specifies the history source from which to retrieve data. Valid values are `History` to retrieve data from history tables and `Summary` to retrieve data from summary tables. When using `Summary`, you must specify the summary frequency in the `resolution` attribute.
- `retrievalMode`: Specifies which retrieval mode to use. Valid values are `Cyclic`, `Delta`, `Full`, `Interpolated`, `BestFit`, `Average`, `Min`, `Max`, `Integral`, `Slope`, `Counter`,`ValueState`, and `RoundTrip`. Make sure that you specify a retrieval mode that is supported for the specified tag type. For example, Counter retrieval does not work with string tags. Therefore, if you try to retrieve data for a string tag in Counter mode, the Historian does not return any data.

  For information on each mode, see Understanding Retrieval Modes.
- `stateCalc`: Specifies which state calculation to use in ValueState and RoundTrip retrieval. Valid values are `Min`, `Max`, `Average`, `Total`, and `Percent`. For more information, see State Calculation (wwStateCalc). If you are not using ValueState retrieval, specify an asterisk (`*`).
- `resolution`: Specifies the retrieval resolution in milliseconds when retrieving history data in cycle-based retrieval modes, or the summary frequency in seconds when retrieving summary data. For more information, see Resolution (Values Spaced Every X ms) (wwResolution)

  Alternatively, you can set this attribute to 0 and specify a retrieval resolution using the `pixels` attribute.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- `pixels`: Specifies the retrieval resolution for cycle-based retrieval modes as the number of pixels per cycle. The number of cycles is the width of the trend chart divided by the value of this attribute. For example, if the chart is 500 pixels wide and the `pixels` attribute is set to 5, then 100 cycles are used.

  Alternatively, you can set this attribute to 0 and specify a retrieval resolution using the `resolution` attribute. If you specify non-zero values for both the `pixels` and the `resolution` attributes, `resolution` takes precedence.

- `movingAverageValues`: Specifies whether to calculate moving averages when retrieving history data. If set to 0, no moving averages are calculated. Otherwise, moving averages are calculated using the number of values specified in this attribute.

### Using the Standard Retrieval Styles

The following table describes the standard retrieval styles available in the Historian Client Trend application.

| Style name | Description |
|---|---|
| BestFit-5 | Best Fit retrieval with one cycle per five pixels. |
| BestFit-10 | Best Fit retrieval with one cycle per ten pixels. |
| BestFit-15 | Best Fit retrieval with one cycle per 15 pixels. |
| Cyclic (ActiveFactory 9.1) | Cyclic retrieval with one cycle per two pixels. |
| Integral (ad hoc) | Integral retrieval for queries longer than 15 minutes. Resolution depends on query duration. Best-fit retrieval with one cycle per ten pixels for queries shorter than 15 minutes. |
| Averages (From Summaries or Ad Hoc) | Tries to retrieve analog averages from summary tables. If no summary data is available, uses Average retrieval for analog tags and ValueState retrieval for discrete tags. Resolution depends on query duration. |
| Averages (ad hoc) | Average retrieval for analog tags and ValueState retrieval for discrete tags. Resolution depends on query duration. |
| Summary (InSQL 8.0) | Tries to retrieve analog averages from summary tables for queries longer than 15 minutes. If no summary data is available, uses Cyclic retrieval with one cycle per pixel for queries longer than 8 hours and Delta retrieval for shorter queries. |
| Counter-20 | Counter retrieval with one cycle per 20 pixels. |
| Counter on round periods | Counter retrieval with cycles at even time periods (one minute, one hour, etc. depending on the resolution). |
| Time In State (percent) | ValueState retrieval with percent calculation for queries longer than one minute. Resolution depends on query duration. Full retrieval for shorter queries. |
| Time In State (Avg) | ValueState retrieval with average calculation for queries longer than one minute. Resolution depends on query duration. Full retrieval for shorter queries. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Style name | Description |
|---|---|
| RoundTrip (PercentContained) | RoundTrip retrieval with percentcontained calculation for queries longer than one minute. Resolution depends on query duration. Full retrieval for shorter queries. |
| RoundTrip (AvgContained) | RoundTrip retrieval with averagecontained calculation for queries longer than one minute. Resolution depends on query duration. Full retrieval for shorter queries. |
| MovingAverage (12-5 sec) | Moving averages for analog tags with 12 values and a resolution of five seconds. Delta retrieval for all other tags. |
| MovingAverage (30-1 sec) | Moving averages for analog tags with 30 values and a resolution of one second. Delta retrieval for all other tags. |
| MovingAverage (10-1 pixel) | Moving averages for analog tags with 10 values and a resolution of one cycle per pixel. Delta retrieval for all other tags. |

### Retrieval Styles, Application Settings, and Tag Settings

There are various ways to set retrieval options in the Trend application: using a retrieval style vs. using custom retrieval options, using the application-wide options vs. using tag-level options. Also, there are some differences depending on which Historian version you are using. The following guidelines help you understand which retrieval settings are actually used in a given situation.

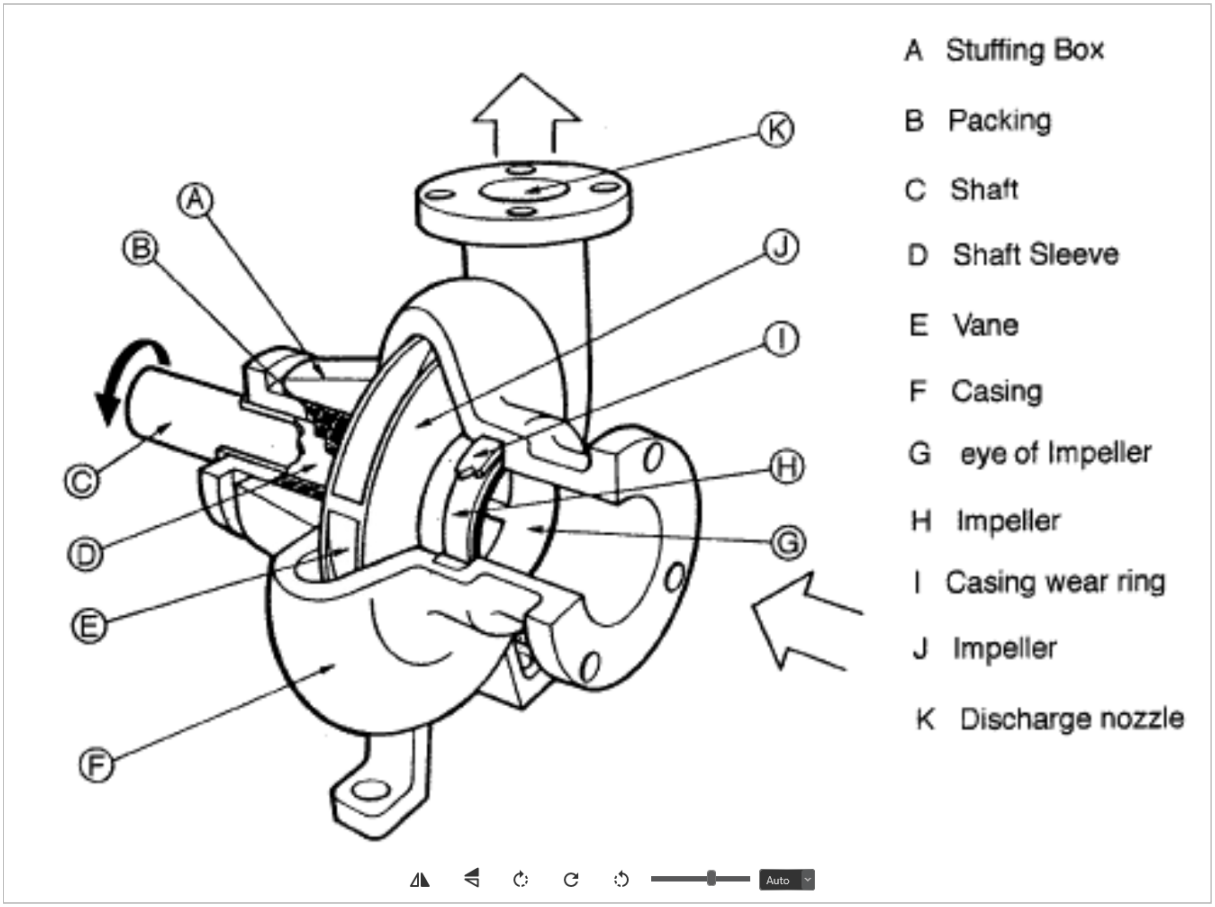
1. Settings at the tag level override settings at the application level. For the aaHistClientTrend control, this means that the properties starting with `CurrentTag...` override the properties starting with `RetrievalOptions...`
2. Because a retrieval style definition can contain multiple sets of retrieval settings with different retrieval modes, some of the settings available for editing at the application or tag level may turn out to be irrelevant for the retrieval mode that actually gets used for a given query. However, because there is no way to know in advance which retrieval mode will be used, the settings are still available for editing. The same applies to properties in the aaHistClientTrend control.
3. At the application level, you can specify additional options for retrieving data from Historians with a version earlier than 9.0. For more information, see Configuring Other Options. These settings override any style that you may have selected at the application level. For example, if you have set these options to enable delta retrieval for periods below 15 minutes, but you have selected a style at the application level that specifies cyclic retrieval for all time periods, the Trend application enforces delta retrieval for all time periods below 15 minutes regardless of the settings in the style.

   However, if you select the style at the tag level, then the style settings override the application options. In the above example, cyclic retrieval would be used for all time periods regardless of the application settings specifying delta retrieval.
4. If there is a conflict between a setting specified in a style and a setting specified using one of the aaHistClientTrend control's properties (for example, retrieval resolution), the style setting overrides the property setting.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Chapter 5 ImageViewerApp

The ImageViewerApp shows an image within a pane of a ViewApp while the ViewApp is running or displayed in preview mode. Users can change the size of the image and its orientation while it is being displayed, but cannot make any permanent changes to the appearance of an image.




The ImageViewerApp supports the following image file types:

- Bitmap (bmp)
- Graphics Interchange Format (gif)
- Joint Photographic Experts Group (jpeg) or (jpg)
- Portable Network Graphics (png)
- Tagged Image File Format (tiff)

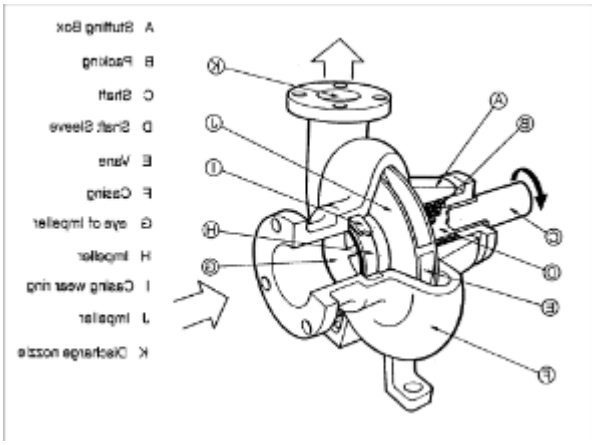
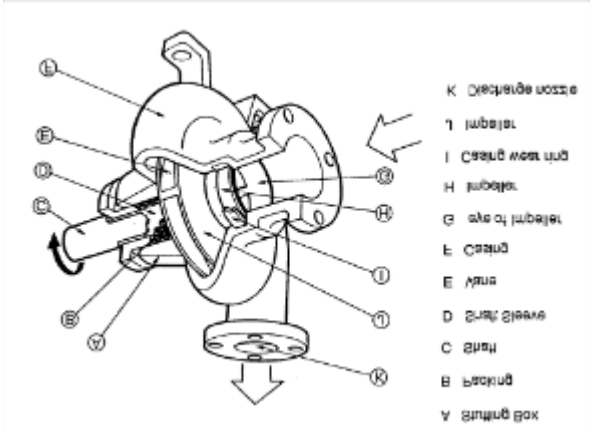
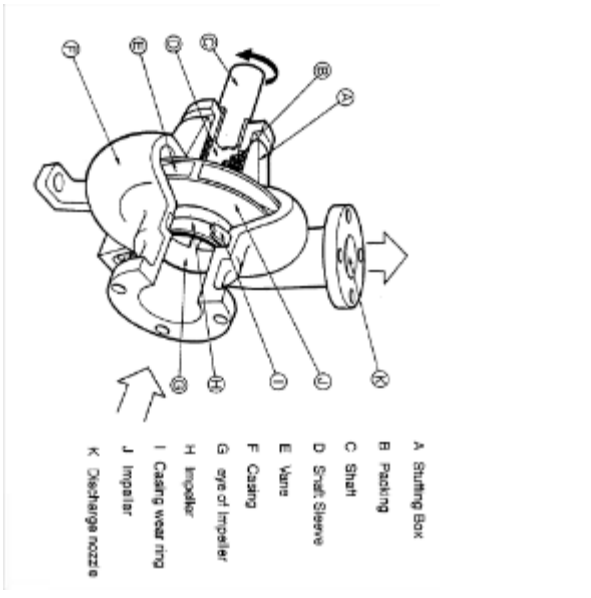
The ImageViewerApp includes a set of visual controls that appear when you change the focus to the pane that contains the image. These controls can be used to change the zoom level, or rotate or flip the image.



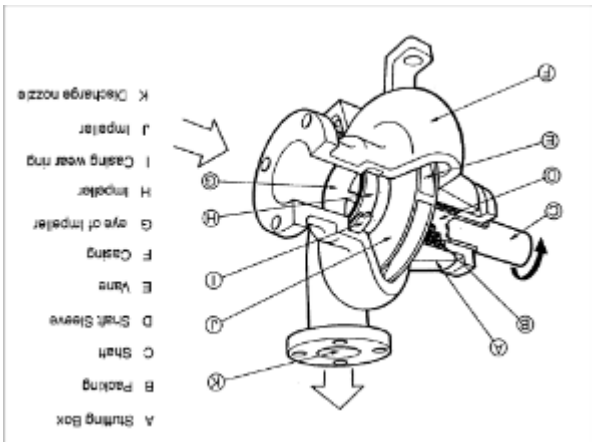

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Change the Orientation of an Image

When the user selects the pane containing an image during runtime or in preview mode, a set of controls appears beneath the image. Users can select a control to change the orientation of the image.

| | | |
|---|---|---|
|  | Flip the image horizontally. |  |
|  | Flip the image vertically. |  |
|  | Rotate the image 90 degrees clockwise. |  |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

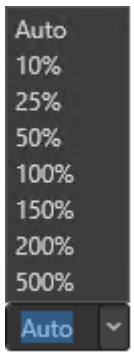
| | | |
|---|---|---|
|  | Rotate the image 180 degrees clockwise. |  |

## Change the Size of an Image

During runtime or preview mode, users can change the size of a displayed image using a set of controls or by keyboard shortcuts.

### Change Image Size by Image Controls

The ImageViewerApp includes controls to change the size of an image being displayed during preview mode or while a ViewApp is running. The user must set the focus of the ViewApp to the pane showing an image and before selecting a size control. Image size can be reduced to a minimum of ten percent and increased to a maximum of 800 percent of its original size.

| | |
|---|---|
|  | Move the slider left or right to decrease or increase the size of the image. |
|  | Change image size by selecting a zoom percentage from a list. Selecting the inverted arrow at the right of the button displays a list of available zoom percentages to resize the image. |

### Change Image Size by Keyboard Shortcuts

The ImageViewerApp supports keyboard shortcuts to enable the user to reduce or increase the size of an image.

- Increase the size of an image by simultaneously pressing the Ctrl key and the key containing the plus sign (+).
- Reduce the size of an image by simultaneously pressing the Ctrol key and the key containing the minus sign (-).

## Scroll an Image

Users can scroll an image vertically or horizontally when the size of an image exceeds the boundaries of the image viewer window. Scroll bars appear in the viewer window when an image is greater than the boundaries of

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

the viewer window. Users can move a scroll bar with their mouse. Also, if the monitor displaying the ViewApp is touch enabled, users can use a single finger vertical or horizontal swipe gesture to scroll the displayed area of an image.

# Touch Support

The ImageViewerApp supports single finger gestures on touch screens or portable devices.

A displayed graphic can be swiped or flicked vertically to move the window view to the top or bottom of the graphic. A displayed graphic can be swiped or flicked horizontally to move the window view to the left or right of the graphic.

A single finger tap can be used to select the visual icons shown within the viewer window of the ImageViewerApp.

See Optimize the ImageViewerApp for a Touch Device for instructions to enlarge the size of the visual icons to make it easier to select them while using touch gestures.

## Optimize the ImageViewerApp for a Touch Device

The visual icons shown within the viewer window of the ImageViewerApp can be enlarged to make them easier to select on touch screens or portable devices.

The following screen captures show the default size of the ImageViewerApp's visual icons and their size after they have been enlarged for touch. AVEVA OMI includes the OptimizeForTouch Boolean attribute that belongs to the MyViewApp.Settings namespace. The default value of OptimizeForTouch is false. When OptimizeForTouch is set to true, the size of the visual icons is enlarged.

| **OptimizeForTouch Attribute Value** | **Icon Size** | **Example Icons** |
|---|---|---|
| MyViewApp.Settings.OptimizeForTouch=False | Regular Size (Non-Touch) |  |
| MyViewApp.Settings.OptimizeForTouch=True | Optimized for Touch |  |

A common way to dynamically adjust the size of the visual icons in a running ViewApp is to place a graphic element like a button on a pane and then associate user input animation to toggle the state of the OptimizeForTouch attribute.

# Compatibility of the ImageViewerApp

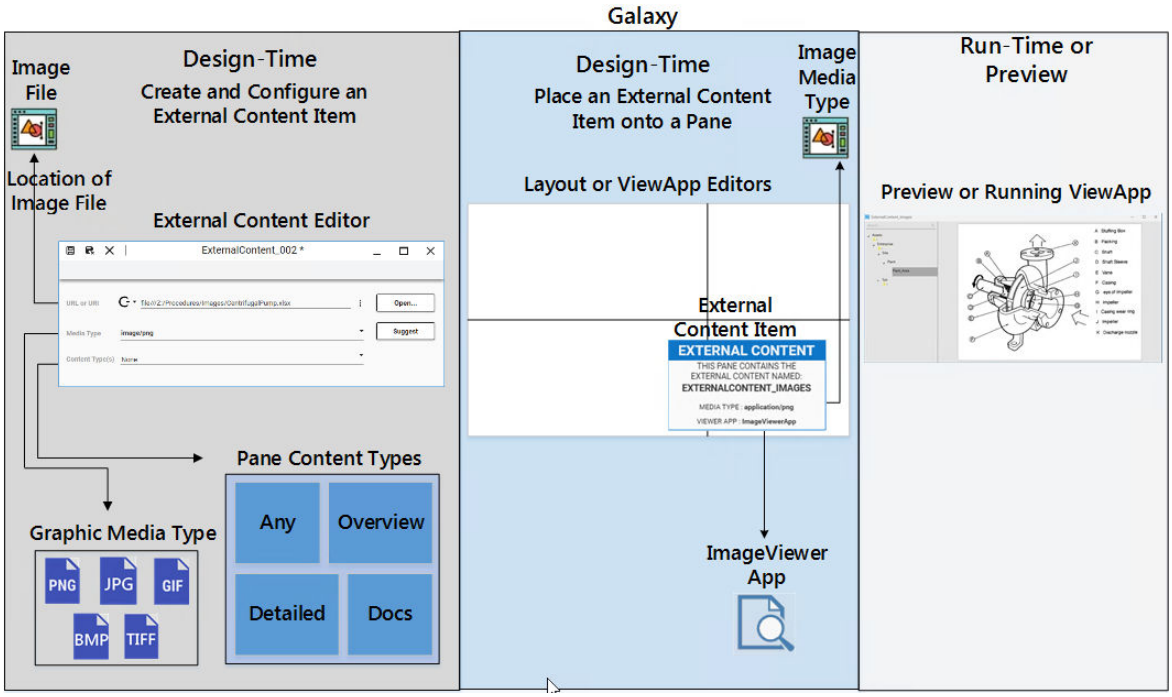
The ImageViewerApp includes compatibility with current and future versions of System Platform.

- The ImageViewerApp package must be installed on a computer running System Platform 2017 Update 3. The ImageViewerApp cannot be installed on any other version of System Platform except Update 3.
- After the ImageViewerApp is installed on a System Platform 2017 Update 3 system, the ImageViewerApp will be able to migrate to future versions of System Platform InTouch OMI when they become available.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Configure the ImageViewerApp

The following figure summarizes using an External Content item to point to a remote computer containing an image that shows the different parts of a pump. An External Content item is configured during design time to identify the location of the image file and its media type. Typically, the External Content item is associated with an asset or a user defined object. The asset or object is selected from the **Toolbox** tab and placed onto a layout pane. During runtime, the user selects an asset associated with a navigation item to show the graphic image.




The major steps to implement the ImageViewerApp to show a graphic in a ViewApp are summarized in the following list:

1. Place a graphic image on a computer accessible from your Galaxy.
2. Create an External Content item.
3. Configure the External Content item that identifies the location and media type of the graphic.
4. Associate an External Content item to a graphic or object.
5. Place an asset or graphic on a ViewApp pane associated with the External Content item.

## Before You Begin

Before starting the steps to configure an External Content item, ensure the following prerequisites have been met:

- If you are placing the graphic file on a remote computer in your network, ensure connectivity between the computer where the ViewApp will run and the computer where the remote graphic has been saved.

  Mapping a network drive is a typical way to connect to a remote computer hosting documents that you want show in a running ViewApp. For this configuration to work successfully, it is important that the computer to

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

which the ViewApp is launched from has the same drive letter mapped to a location having the referenced document.

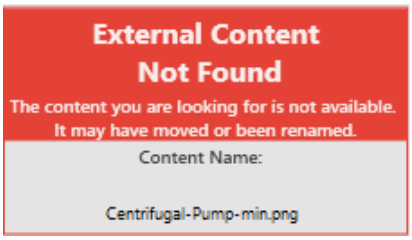
The ImageViewerApp shows an error message to the user if the specified URI connection to the graphic is bad. For more information about the error message, see ImageViewerApp Error Message (see ImageViewerApp Error Message on page 355).

- Save the graphic in a presentation format supported by the ImageViewerApp.

  The ImageViewerApp supports GIF, JPG or JPEG, PNG, or TIFF graphic file types.

### ImageViewerApp Error Message

An External Content item includes an **URL or URI** option to specify the location of the graphic file to be shown by the ImageViewerApp during runtime or in preview mode. The specified location of the file must be complete and accurate. If the file is moved, deleted, or renamed, the ImageViewerApp shows an error message to the user during runtime, but the ViewApp continues to run.




## Create an External Content Item

You create an External Content item from the Visualization folder of the System Platform IDE. Initially, the External Content item defaults to a set of values that can be changed using the External Content editor.

### To create an External Content item

1. Open the IDE and select the **Visualization** tab.
2. Select a folder within the **Visualization** folder if you want to create a new External Content item at a specific location.
3. On the **Home** ribbon, in the **Create** area, select **External content**.

   You can also create an External Content item by other methods:

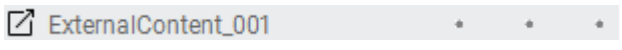
   - **Keyboard Shortcut**

     Press Ctrl + Shift + C

   - **Shortcut Menu**

     Right-click a folder of the **Visualization** folder to show a shortcut menu. Select the **New** option, and then select **External Content**.

   A new **External Content** item is created in the **Visualization** folder**.**

   The name of the new item follows a default naming convention of appending a three-digit number to the word ExternalContent.
4. Rename the External Content item.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

After you create an External Content item, it must be configured to specify the remote location of the content and its media type.

## Configure an External Content Item

Each External Content item has three properties that must be assigned values:

- URL or URI
- Media Type
- Content Type(s)

An External Content item is modified from the External Content editor. The editor can be opened by double-clicking an item from the Visualization folder. Also, an External Content item that has been placed onto a layout pane can be edited from the Layout and ViewApp editors by the selecting the item from the Actions list.

**To configure an External Content Item**

1. Open the IDE and select the **Visualization** tab to show the External Content items available in the Galaxy.
2. Double-click an External Content item to open within the External Content editor.

   For more information about each field in an External Content item, see Details of the External Content Editor.
3. Enter a URI string or web site URL in the **URL or URI** field where the graphic file is saved.

   The value you enter is the location of the external content specified by a URI-formatted string. A media location must be specified.

   You can browse for the graphic file by selecting the vertical dots icon to the right of the data entry field. A drop-down list includes a **Browse for file** option that enables you to browse your network and select a file. The **URL or URI** field updates and shows a formatted URI path to the file.

   You can also enter a URL to a web site by selecting the **http://** or **https://** options from the drop-down list. The **http://** and **https://** options assist the user when entering URLs by prefixing the URLs with the selection.

   See More Information About Specifying a URI, More Information About Specifying a URI, More Information About Specifying a URI, More Information About Specifying a URI for information about the format of a URI string.
4. Select the **Open** button to validate the URI or URL you entered.

   The **Open** button launches the appropriate application on the computer associated with the graphic file type.
5. Select the type of media associated with the graphic file type from the drop-down list of the **Media Type** field.

   The ImageViewerApp supports five image media types:

   - **image/bmp**
   - **image/gif**
   - **image/jpeg**
   - **image/png**
   - **image/tiff**

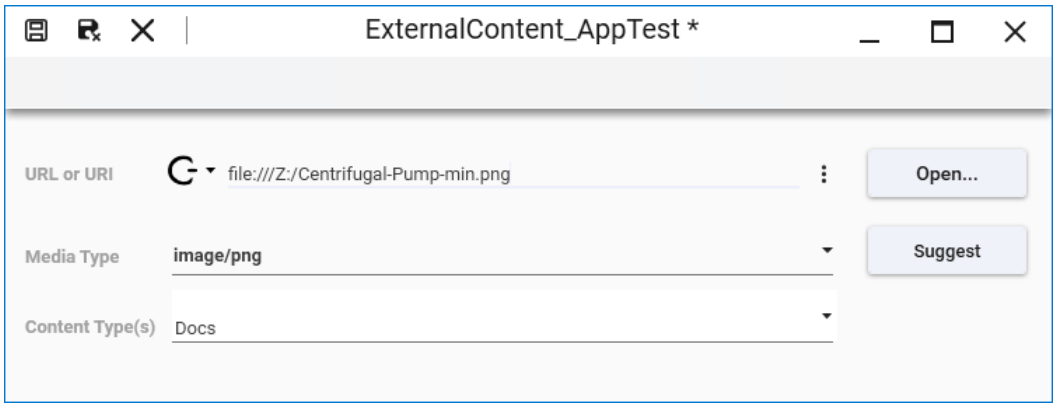
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

See More Information About Media Types, More Information About Media Types, More Information About Media Types, More Information About Media Types for more information about supported media types.

6. Select the type of content from the drop-down list of the **Content Type(s)** field.

   The value you enter is used by content-placement algorithms within AVEVA OMI during run time to determine the placement of content when AutoFill or ShowContent calls are invoked.

   The configured External Content item for an image file should look like the following screen capture.




7. Save your changes and exit from the External Content item.

## Link an External Content Item to an Object or Template

There are three ways to integrate an External Content in a ViewApp.

- Associate an External Content item to an object template, which is described in the following procedure
- Associate an External Content item to a custom navigation item that appears in the navigation model of the ViewApp.
- Place the External Content item on a layout pane, which is the simplest way and is described in Associate an External Content Item to a ViewApp.

### To link an External Content item to an object template

After you have created and configured an External Content item, you can link it to an object template. External Content items can be linked only to objects as opposed to graphics, which can be linked to or owned by an object. All External Content items reside in the Visualization folder. A single External Content item can be linked to multiple objects.

1. Open an object template in the **Object Editor**.
2. Select the **Attributes** tab.
3. In the **Content** pane, select the **Link Content** button.

   The Galaxy Browser opens.
4. Navigate to the folder that contains the **External Content** item to be linked.
5. Select the item, then click **OK**.

   The item is added to the object and appears in the **Content** tab.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

**Note:** After linking an External Content item, you can modify it by selecting it and then pressing the **Edit** button. However, any changes you make will apply to all objects that link to the item.

6. Save your editing changes to the object template and exit from the Object Editor.
7. Create an instance of the of the linked object template.
8. Create a layout which contains pane with a Content Type that matches the content type of the External Content item.
9. Add a navigation tree to the layout
10. Create a ViewApp that incorporates the layout.
11. Deploy the ViewApp.

    In runtime, navigate to the object or any instance created from the template. External Content item will auto-fill the matching pane to show the external content.

## Associate an External Content Item to a ViewApp

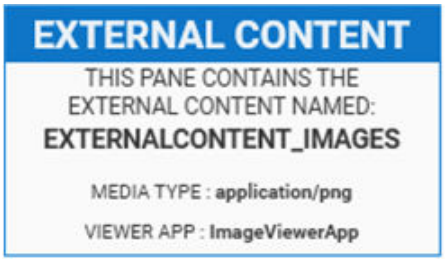
You can place an External Content item directly onto a pane from either the Layout or ViewApp editors . External Content items are listed in the **Toolbox** or **Assets** tabs of either editor.

**To associate external content to a ViewApp**

1. Open the System Platform IDE and select the **Visualization** tab to see the list of layouts.
2. Select a layout that you want to insert external content and open it in the Layout editor.
3. Select the **Toolbox** tab of the Layout editor to show the list of content accessible from the Galaxy.
4. Locate the External Content item you want to place in the layout you selected.

   External Content thumbnails appear beneath of the list of content shown in the **Toolbox** list.
5. Select an External Content thumbnail from the **Toolbox** area, and then drag and drop it onto a pane of a layout incorporated into a ViewApp.

   The External Content thumbnail appears in the pane containing the name of the External Content item, the media type of the external content, and the viewer app that will display the media during runtime. Also, the layout **Actions** area shows the name of the External Content item and the pane that it was placed in.




# Editing an External Content Item After Being Placed onto a Pane

An External Content item can be modified after being placed in a layout or a ViewApp, which automatically propagates the changes

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### To edit an External Content item in a layout

1. If necessary, open the layout containing an External Content item.
2. Locate the item in the layout **Actions** list.
3. Select the **Options** icon shown at the right of the item in the **Actions** list.

   A drop-down list shows an **Edit External Content** command.
4. Select the **Edit** command.

   The External Content editor opens the item for editing.
5. Update the values assigned to the item and save your changes.

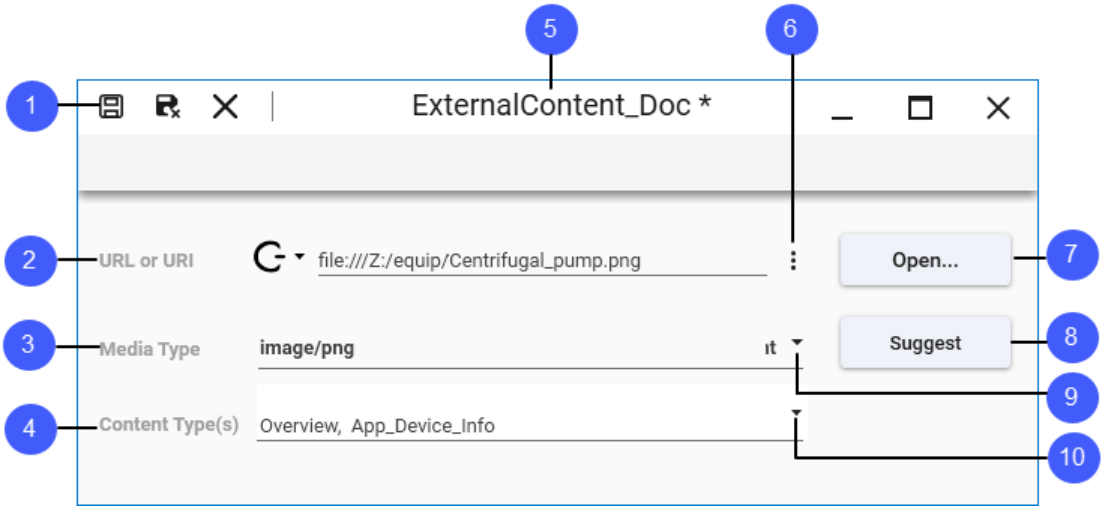
   The External Content thumbnail placed in a pane updates to reflect the changes made to the item.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Details of the External Content Editor

You use the External Content editor to configure an External Content item for a document. Before you configure an External Content item, you must know:

- Network location of a document
- Media type of the document
- Content type(s) of the layout pane that will host the External Content item




| | |
|---|---|
| 1 | Commands to save, save and close, and close the External Content editor. |
| 2 | URL or URI that specifies the location of external media using a standard format. See More Information About Specifying a URL or URI for the format of a URI or URL<br>A warning message appears if the document cannot be located during runtime. |
| 3 | A media type is a two-part identifier that specifies the type of application required to process or view remote content. A media type can be entered in the field or selected from a drop-down list. See More Information About Specifying a MediaType for the format of a Media type value.<br>A warning message appears if a media type is specified that does not have an associated viewer application. |
| 4 | Content type assigned to the external media that enables ViewApp algorithms to place content in specific panes during runtime. |
| 5 | Name of the External Content item. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| 6 | Drop-down list with options to browse for an external content file or specify a URL using HTTP or HTTPs. |
| 7 | Validates the location of external media specified in the **URL or URI** field. An attempt is made to display the external media in an application assigned as the default by the operating system, not the app specified for the external content media type.<br>A warning message appears if the content cannot be found at the location specified in the **URL or URI** field. |
| 8 | **Suggest** is optional. When selected, it automatically selects a media type based on the entry in the **URL or URI** field. The entered value can be changed if the suggestion does not match the expected media type.<br>**Note**: Ensure the suggested media type is correct. The external media does not appear if the media type is incorrect. |
| 9 | Drop-down list of commonly used media types. Media types that have apps in the Galaxy capable of servicing them are shown in bold text. |
| 10 | Drop-down list of content types that can be used at preview\runtime to assign the external content to panes of a matching content type.<br>**Note**: None is not a content type. Instead, it simply means a content type has not been assigned to the pane. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

## More Information About Media Types

A media type is a standard two-part string analogous to a MIME type that identifies external content file types and their format. System Platform uses a media type to identify external content and the type of app required to display media during runtime.

A media type consists of a type and a subtype, which is further structured into a tree.

type "/" [tree "."] subtype ["+" suffix] *[";" parameter]

For more information about the format of media types, see https://www.iana.org/assignments/media-types/media-types.xhtml

System Platform provides several default media types that include associated apps to display media. The drop-down list of the **Media Type** field shows the default media types in bold text to indicate a viewer app is available in the Galaxy that can service external content with these media types. Other listed media types that appear in plain text require an app to be created and imported into a Galaxy to play the specified media.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

## More Information About Specifying a URI

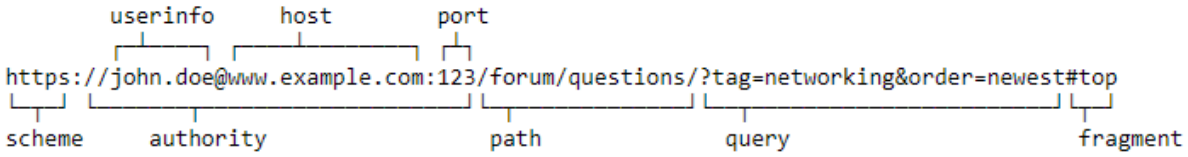
In the context of External Content, a Uniform Resource Identifier (URI) is a string that identifies the pathway to specific content that can appear in a running ViewApp.

All URIs adhere to predefined syntax rules.

- Generic URI syntax consists of a hierarchical sequence of components

  ```
  URI = scheme:[//authority]path[?query][#fragment]
  ```

  **Example**

- Each URI begins with a scheme name followed by a colon

  Examples of common scheme names include http:, https:, and file:

- An optional authority component preceded by two slashes (//)
  - Use information component consisting of a user name and optional password preceded by a colon followed by an at symbol (@)

    //username:password@

  - Host subcomponent consisting of a registered hostname or IP address
- A path component consisting of a sequence of path segments separated by a slash (/). A path is always defined for a URI, though the defined path may be empty
- An optional query component preceded by a question mark (?), containing a query string of non-hierarchical data.

For more information about the format of a URI, see https://tools.ietf.org/html/rfc3986

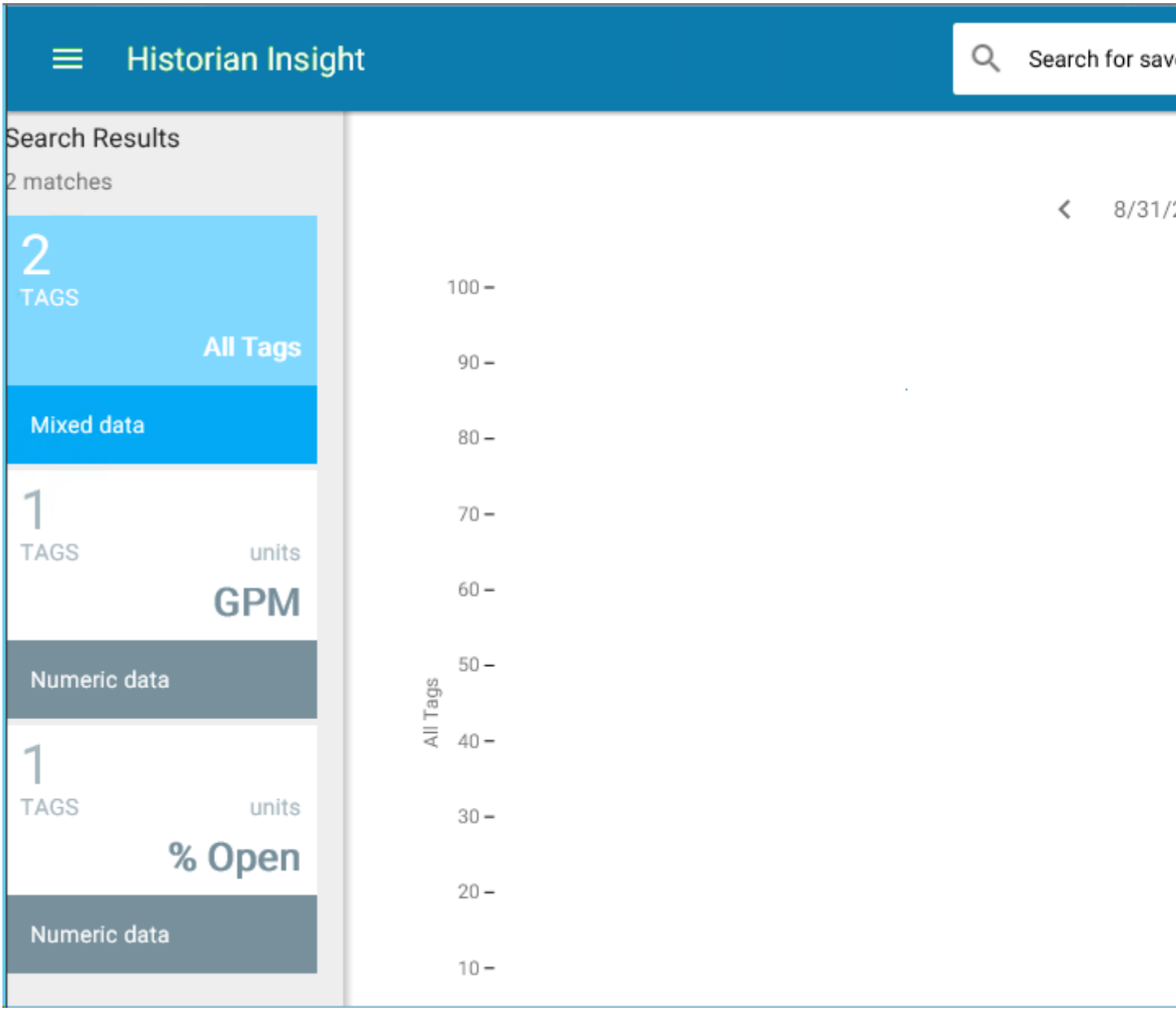
The following examples show common URIs that identify External Content within a Galaxy

- ftp://ftp.is.co.za/rfc/rfc1808.txt -- ftp scheme for File Transfer Protocol services
- file:///Z:/Media/Runtime%20Language%20Switching.mp4
- http://www.exampleserver.com/documents/index.html

# InSightApp

AVEVA OMI provides the InSight App to run an active InSight browser session within a pane of a running ViewApp.The InSight app provides a visualization of operational data by retrieving information from the Historian. The InSight app includes a search engine. Users enter keywords into the search box to retrieve relevant information.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




## Steps to Configure the InSightApp

InSightApp instance level properties are evaluated only when the default values are changed and have a higher preference over chart configuration properties set with the InSight Global Editor.

**Important**: You must complete all user security or authentication tasks required to access data from the Historian Client Web server. For more information about security requirements, see InsightApp Security Requirements.

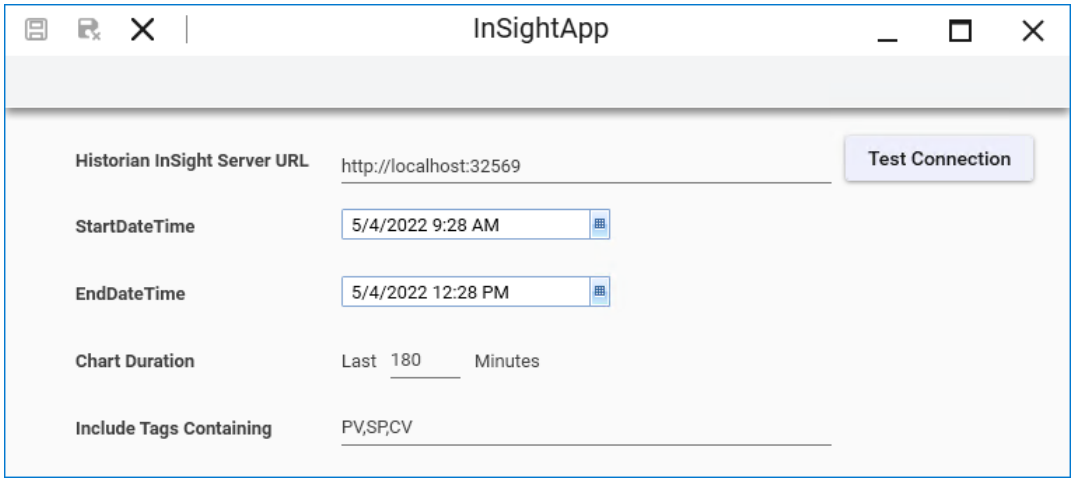
Configuring the InSightApp is a two-step process of validating the connection to the InSight server and setting app properties.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

Chart configuration properties set by the Global Editor and properties set from the Layout or ViewApp editors may not be the same. Changing any property value from the InSight Global Editor does not appear at instance level during design time. Instance level properties continue to show default values at design time.

### To configure the InSightApp

1. Open the System Platform IDE **Visualization** tab and locate the InSightApp in the AVEVA OMI Apps folder.
2. Double-click on the InSightApp to open the **InSightApp** dialog box.




   The dialog box shows the default values assigned to the InSight Server URL, the chart duration, and tags recorded in an InSightApp chart.

   **Note**: These same configuration properties can be specified after the InSightApp has been placed on a layout pane.

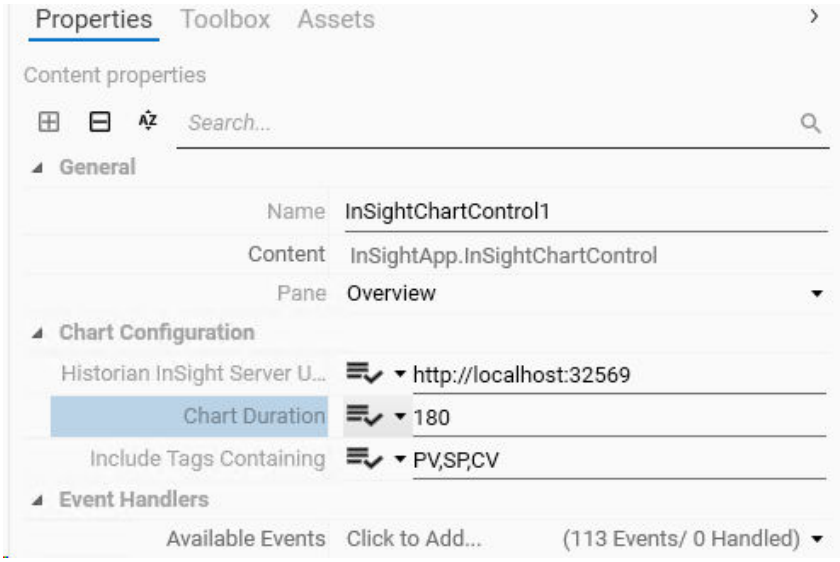
3. Test the connection to the InSight server and update the URL if necessary.
4. Change the chart duration and the monitored tags if you do not want to accept the default values.
5. Save your changes.

### To configure InsightChartControl properties

1. Open the Layout or ViewApp Editor and show the items listed in the **Toolbox** tab.
2. Select **InSightChartControl** from the **Toolbox** list to show its preview thumbnail.
3. Drag and drop the thumbnail on a layout pane.
4. Select the **InSightAppChartControl** thumbnail in the pane and select the **Properties** grid.

   The **Properties** grid shows the **InSightChartControl** properties.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




The **Content** and **Pane** fields show the assigned content type and the name of the pane in which the **InSightChartControl** is placed.

5. Enter the URL in the **Historian Insight Server URL** field.

   The default Historian Client Web server URL is http://localhost:32569. A static or dynamic URL can be configured. The type of control property /attribute binding can be specified by selecting a value from the drop-down list.

| | |
|---|---|
| **Constant** | Static binding to the specified URL. Enter a value in the data entry field. |
| **In** | Dynamic URL with read only binding by the control to a reference. |
| **Out** | Dynamic URL with write only binding by the control to a reference. |
| **InOut** | Dynamic URL with read/write binding by the control to a reference. |
| **Reset** | Reset the current property to its default value. |

   Connection settings to the Historians are configured on the server side. This configuration is normally done when System Platform is installed. The connection can be configured to either **favor** or **require** an encrypted connection, regardless of the URL (encrypted or unencrypted) that you configure here.

   - **Favor trusted connections, but permit untrusted connections.** If this option has been configured, and if a trusted connection available, users will be prompted to select one of three options:
     - **Always use the trusted connection**
     - **Use the trusted connection this time**
     - **Continue with the untrusted connection (not recommended)**
   - **Require trusted connections**.

6. Enter a chart duration time as the value of the **Chart Duration** property.

   The default chart duration is 180 minutes. Valid durations range from 1 minute to 5256000 (10 years). A static or dynamic **Chart Duration** property value can be configured and the type of app property /attribute binding can be specified with the property. Use the same switch settings shown for the **Historian Client Web Server URL** property to configure static or dynamic binding for the **Chart Duration** property.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

7. Enter a comma delimited search string, which is used by Historian Client Web to show for **Include Tags Containing** property.

   The default search string is PV,SP,CV.

   The InSightApp uses this string to search for matching attributes. Attributes that match the search string appear in the InSight chart. This property cannot be empty. Valid property values can include numbers, alphabetic characters, and the following special characters $ # _ .

   A static or dynamic **Include Tags Containing** property value can be configured and the type of app property / attribute binding can be specified with the property. Use the same switch settings shown for the **Historian Client Web Server URL** property to configure static or dynamic binding for the **Include Tags Containing property**.

8. If you want to create event handler scripts, select the **Available Events** data entry field to show a list of InsightApp events. For more information about creating event handler scripts, see Add an Event Handler Script.

9. Save your changes.

## InsightApp Security Requirements

A logged in user must be an authorized Historian user to view a chart displayed by the InsightApp in a running ViewApp. InSightApp uses the SSO (Single Sign-On) feature.

Typically, users can connect to a Historian server from the InSightApp using an unencrypted (HTTP) connection. (Even without an encrypted connection, the user credentials exchanged during login are still encrypted.) You can also use an encrypted connection (HTTPS) for the REST API, and this requires configuring an X.509 certificate for TLS (transport layer security).

### About TLS, HTTPS, and X.509 Certificates

TLS allows for encrypted authentication credentials to be passed between a server and client. A certificate containing a private key is passed between the client and server to verify identification and allow access.

Using HTTPS ensures that communication between the client and server is encrypted, helping to prevent third parties from stealing or tampering with your data.

To configure the HTTPS connection to the Historian, you need an X.509 certificate. The certificate can be from a trusted authority or a self-signed certificate. During the installation and configuration of the Historian, you can import a certificate from a trusted authority if you have one, otherwise the configurator can create a self-signed certificate for you.

InSightApp supports OS Group or OS User based security. Galaxy authentication mode is not supported. Security is configured on the server-side (typically, at time of installation), and this configuration determines what happens when an InSightApp user connects using an unencrypted (HTTP) connection. There are two server-side connection options:

- **Favor trusted connections, but permit untrusted connections.** See Favor trusted connections for more information.
- **Require trusted connections**. For this option to work, the client must trust the certificate. See Require trusted connections for more information.

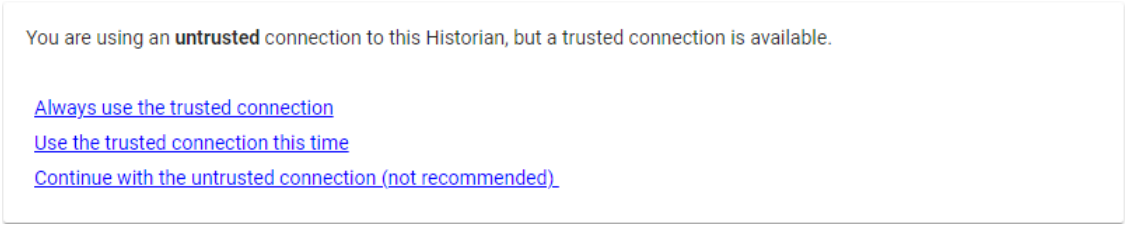
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

InSightApp runs in the context of the logged on ViewApp user. A message appears if security is not enabled or if an authorized Historian user is not logged on to the ViewApp. A message also appears if a secure connection was configured but is not available.

## Favor trusted connections

### Favor trusted connections, but permit untrusted connections

If this option was configured for the server, users are informed there is a trusted connection available, and they can decide how to proceed using one of three options:




- **Always use the trusted connection**

  If the user clicks this link, their browser will be permanently redirected to the HTTPS connection. Any future attempts to use the HTTP connection with the same browser are automatically redirected to the HTTPS connection without a prompt.

- **Use the trusted connection this time**

  Clicking this link redirects the browser to the HTTPS connection, but only for this session. The next time a connection is made in a new browser session, the user is prompted to choose again.

- **Continue with the untrusted connection (not recommended)**

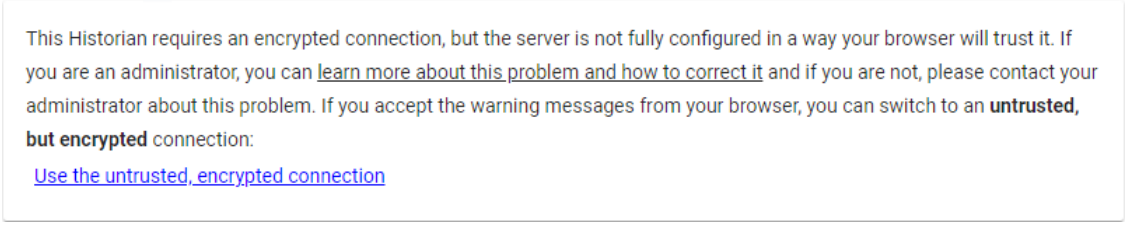
  If the user clicks this link, the browser continues using the HTTP connection, but only for this session. The next time a connection is made in a new browser session, the user is prompted to choose again.

## Require trusted connections

### Require trusted connections (clients must trust this certificate)

If this option was configured for the server, and you are using a certificate from a trusted authority, users are redirected to the HTTPS connection.

If you are using an untrusted certificate, such as a self-signed certificate, the following informational message is displayed:




Users can click **Use the untrusted, encrypted connection** to use the HTTPS connection.

**Warning:** It is important to understand the risks associated with using an untrusted self-signed certificate. The browser warnings encountered while using a self-signed certificate could also indicate that the server has been

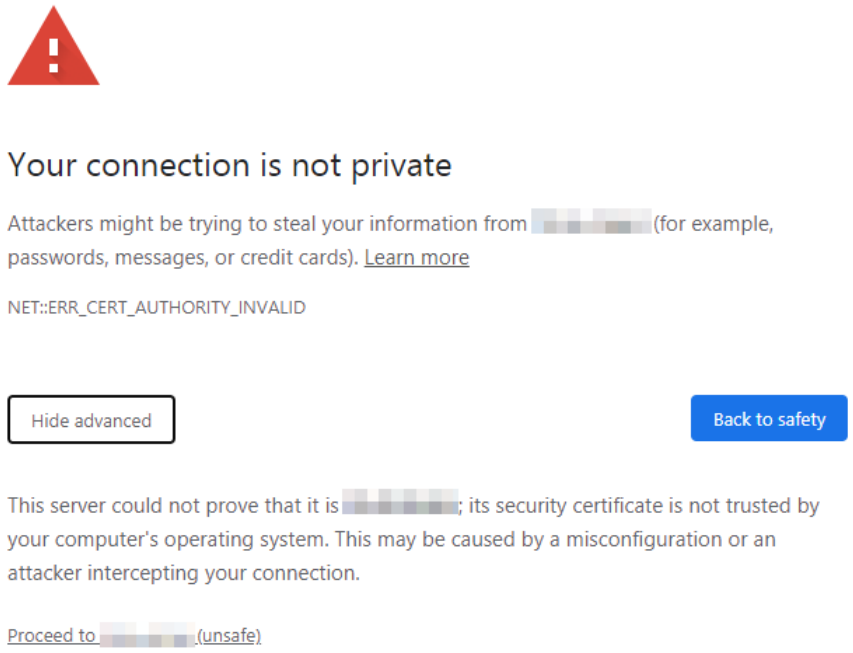
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

compromised or hijacked by a third party. To avoid the risk of conditioning users to ignore important security warnings, follow the steps in the next section to enable remote clients to trust the self-signed certificate.

## Using a Self-Signed Certificate

If you choose to use a self-signed certificate with the Historian, you are responsible for configuring all clients to trust that certificate. Clients that haven't trusted the certificate see a security warning in their browser.

For example, if the Historian was configured to use a self-signed certificate, users connecting with the Google Chrome browser see a warning message similar to the following:




# MapApp

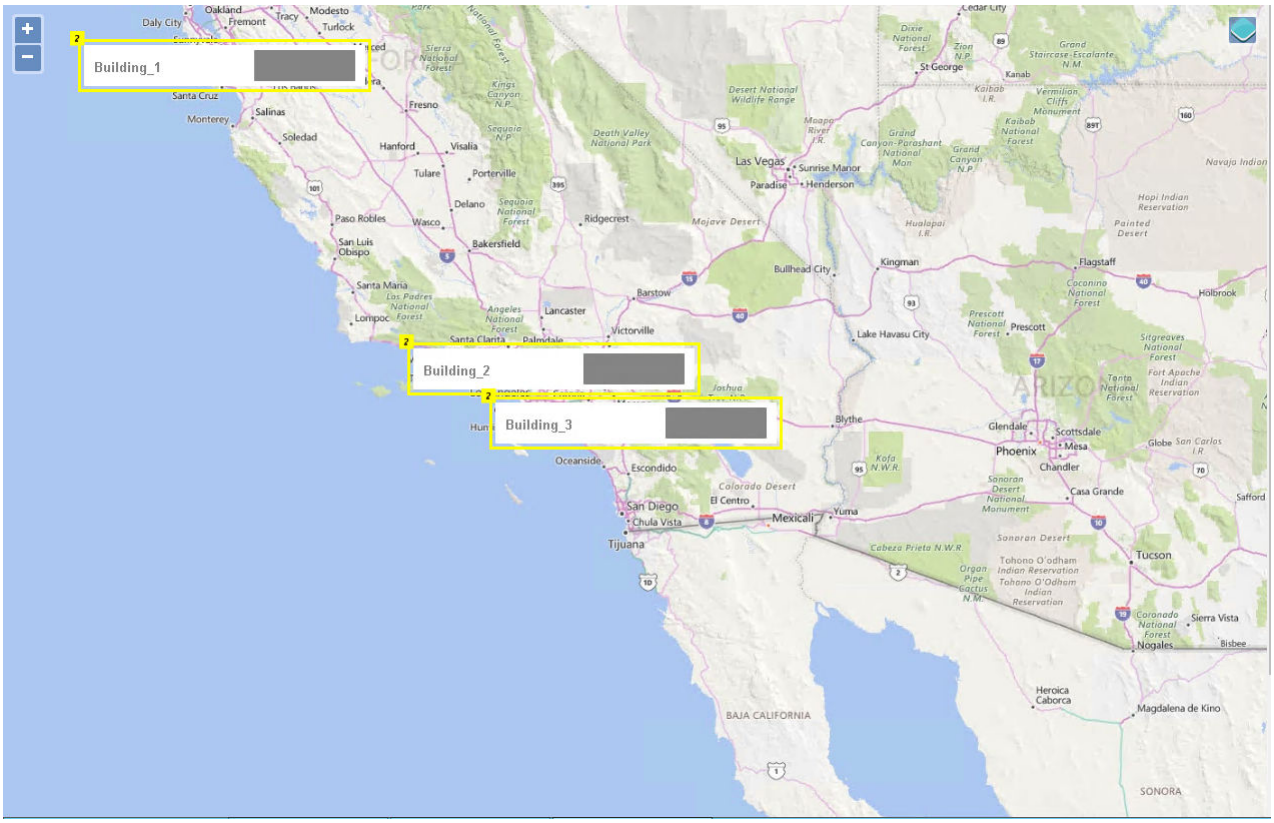
AVEVA OMI includes a Map app to show a map containing graphics within a running ViewApp. During run time, the map provides controls and touch support to enable users to pan to different areas of the map and zoom in or out to show more or less map detail. Graphics placed in a map typically represent business assets located within an area shown by the map. These graphics can include alarming to show the current state of processes at each business location.

You can add map pins to a map through an action script and display assets on a map by zoom levels.

The following example map shows alarm indicators indicating the location of buildings and the current alarm state of each building. During run time, users can click zoom buttons at the upper left corner of the map to zoom the view in or out. Different map data appears based on how you assigned your company's asset data to the zoom layers. Selecting the icon at the upper right corner of a map shows a list of base maps and overlays that can be selected to show different data within the current map view.

The MapApp supports touch gestures when a ViewApp runs on a touch-enabled device. Users can pan, zoom, or select items shown on a map using standard touch gestures.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




# Configure the Map App Global Settings

Configuring a Map app is a three-step process of completing a set of preparatory tasks, configuring global map sources whose data will be shown by the app, and then setting individual Map control properties.

1. Complete a set of preparatory tasks, see Before Configuring a Map App
   - Set up accounts with the supported map vendors whose data you want to show in your ViewApps.
   - Create user credentials to restrict access to the data shown by specific map vendors.
   - Configure a local map server to save data from your map vendors.
   - Create a set of graphics that will appear on your maps.
2. Configure Map app global settings, see Configure Map Sources

   You must first select your map providers and the types of data you want to be shown on your maps.The provider data can be hosted both on a local or remote map server. During run time, the Map app can display a base map and overlaid data layers. Most providers will require a web server, but other providers offer map tiles that can be stored locally in a shared folder.

   While configuring the map sources of a Map app, you create a set of named layers. Each layer is a range between minimum and maximum zoom percentages. Within layers you place graphics representing your company's assets and assign coordinate locations to them. You drag and drop your geographic graphics onto a map layer.
3. Configure Map app properties, see Configure the Map Control

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

The Map app also includes a set of control properties that are configured from the Layout or ViewApp editors. Configuring Map app properties is done after you have configured your map sources

## Before Configuring a Map App

Complete the following prerequisite tasks before configuring the Map app.

- Set up accounts with the various map providers to access data from their servers.

  See Configure Map Sources for a list of map sources supported by the Map app. Each map vendor includes a unique set of properties that must be configured in the Map app.

- Create user credentials if your map providers require an API key or a specific user account to access their data.

  See Create User Credentials for instructions to authenticate users by OS based security credentials.

- Create a local map server to store geographic data from the various supported map vendors

  See Set Up a Map Server for an example of setting up and using an open source map server to store your map data.

- Create a set of graphics to show the location of your assets on a map.

  Design graphics large enough to be viewed easily at different map layers yet small enough not to overlap other graphics in the same layer. If you want, configure the graphic to show the current alarm state of some process variable occurring at the geographic asset.

## Create User Credentials

You must create user credentials if your map providers require a specific user account to access their data. When a user logs into a ViewApp, the user can see those map layers in which credentials have been assigned. A layer is hidden from the user if a credential has not been assigned.

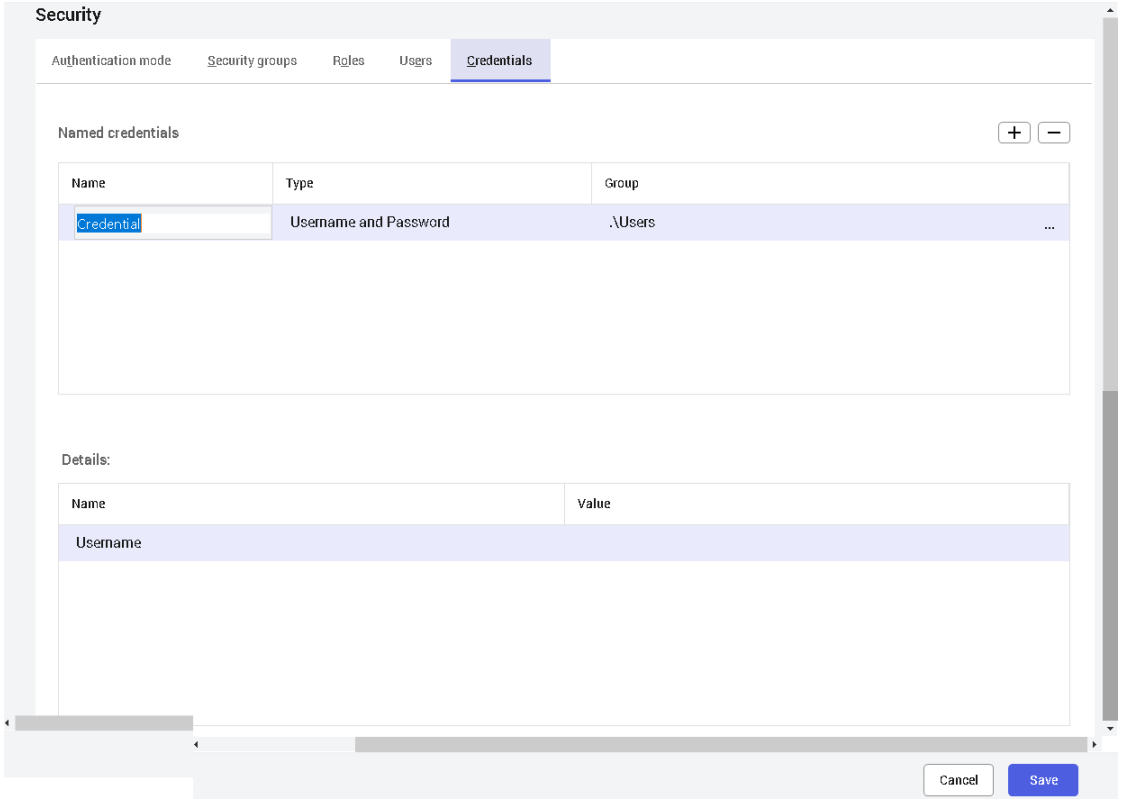
For more information about setting user credentials, see Configuring Security in the Application Server Help.

**Important**: Some map providers do not require user credentials to access their data. In that case, the prerequisite task to create user credentials can be ignored.

### To create user credentials

1. Open the System Platform IDE.
2. Select **Galaxy** from the ribbon, then select **Configure**, then **Security** to show the **Security** area.
3. Select the **Authentication Mode** tab and set the **Authentication Mode** to **OS User Based**.
4. Select the **Credentials** tab.
5. Select the plus button to add a credential.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




6. Select **Username and Password** from the **Type** drop down list.
7. Enter the name of the credential in the **Name** field.
8. Edit the fields of the **Details** area to assign a credential username and password that will be used to authenticate the user to the map server.
9. Click **OK** to save your security configuration changes.

## Set Up a Map Server

**Note**: This example explains how to set up a map server using open source Java Runtime Environment (JRE) and another open source product call GeoServer. This example is intended to show the typical workflows to create a map server to store your map data on a local server. But, there are a wide variety of other commercial and open source products that can be used to build a map server and you are not restricted to the combination of products used in this example.

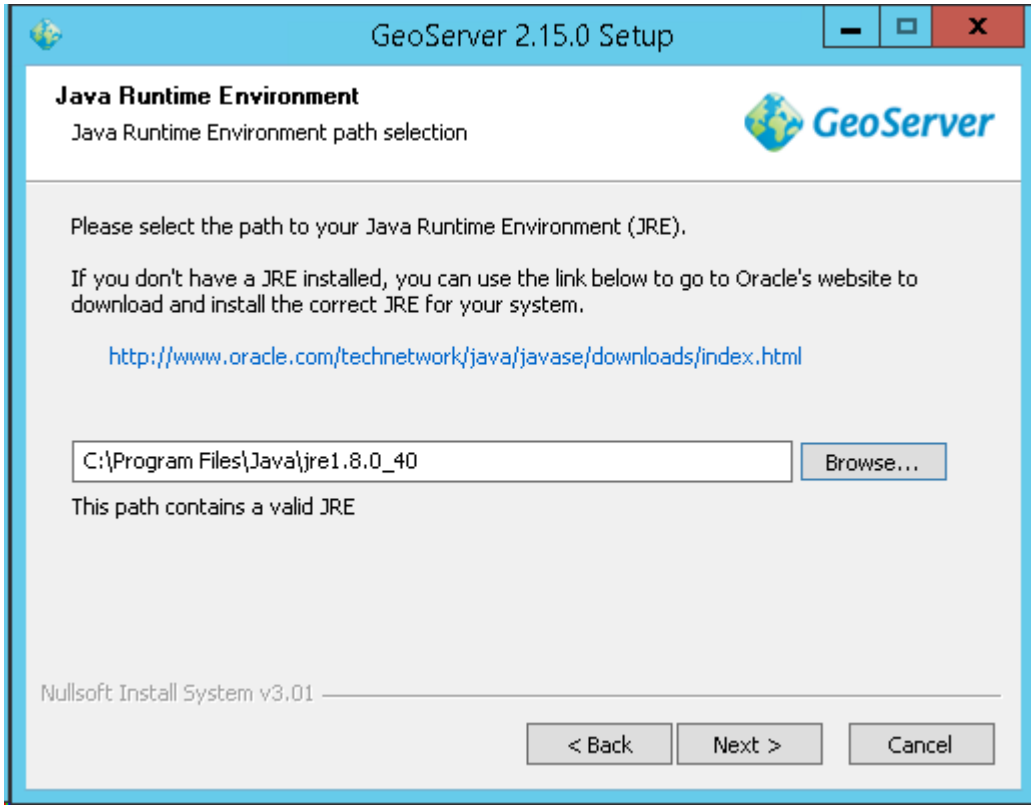
The following procedure describe how to install and configure an open source map server called GeoServer. The procedure is intended only as an example to show the typical workflows to configure a web based map server. Other open source and commercial products can be used as your local map server to save map data that will be shown by the Map app in a running ViewApp.

**Note**: When enabled, Cross-Origin Resource Sharing (CORS) refers to the ability of a JavaScript on one server to access resources on another server. Typically, most servers disable CORS to reduce the likelihood of malicious scripts from accessing resources on another domain. You must enable CORS on your map server to enable map data to be shown in a running ViewApp in another domain.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### To Configure a map server

1. Install a 64-bit version of Java Runtime Environment (JRE).
2. Install GeoServer and locate the folder path to the JRE.




3. Accept the default data directory.

   `C:\Program Files (x86)\GeoServer 2.15.0\data_dir`

4. Set the username and password of the GeoServer administrator.

   The default administrator username and password are `admin` and `geoserver`.

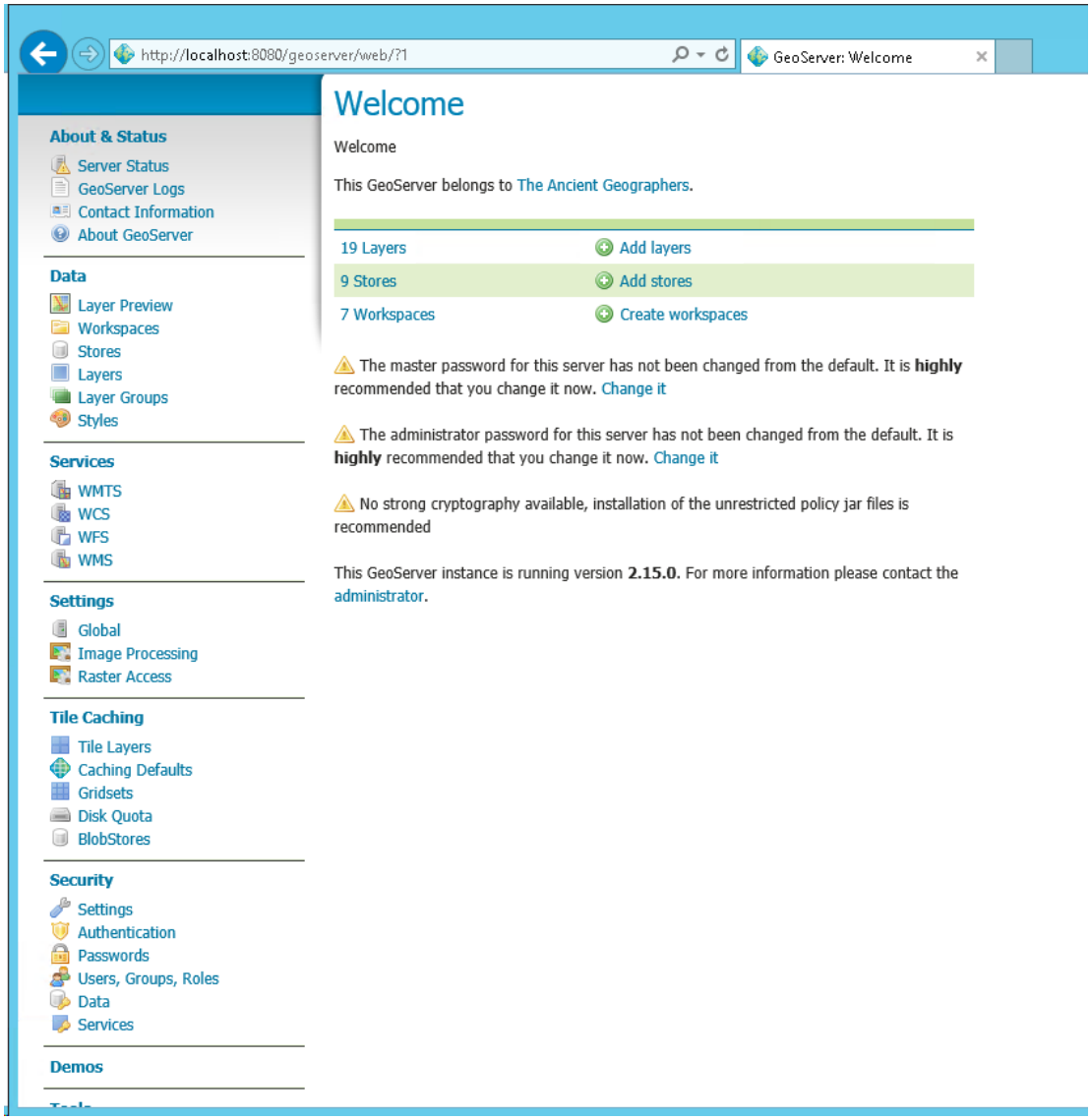
5. Set the GeoServer web server port, which is 8080 by default.
6. Select the **Run manually** option for the type of installation.
7. Select **Install** to start installing the map server.
8. Select **Finish** to end the installation procedure.
9. Start GeoServer.

   You can find the **Start GeoServer** option in the Windows Start Menu, or you can run startup.bat in the GeoServer folder(such as C:\Program Files (x86)\GeoServer 2.15.0\bin).

10. Open a web browser and log on to the GeoServer administrator page using your administrator credentials.

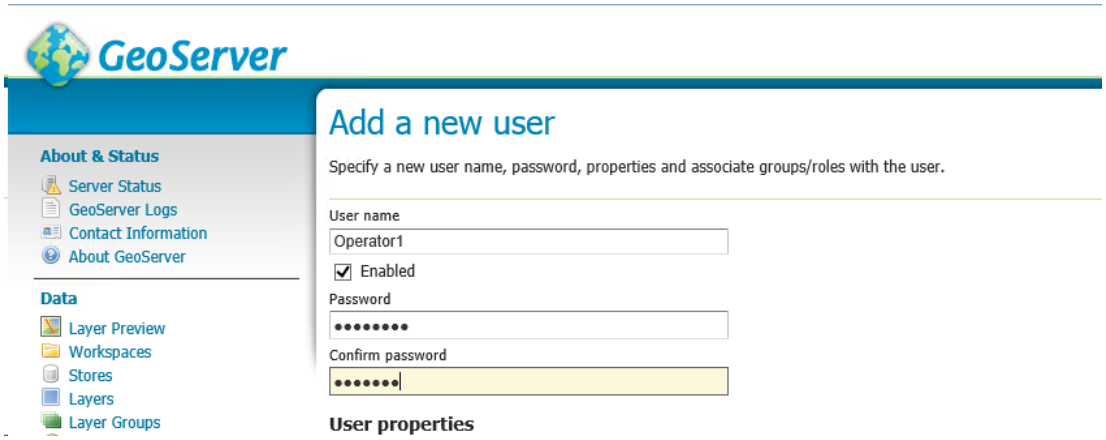
    `http://localhost:8080/geoserver/web`

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

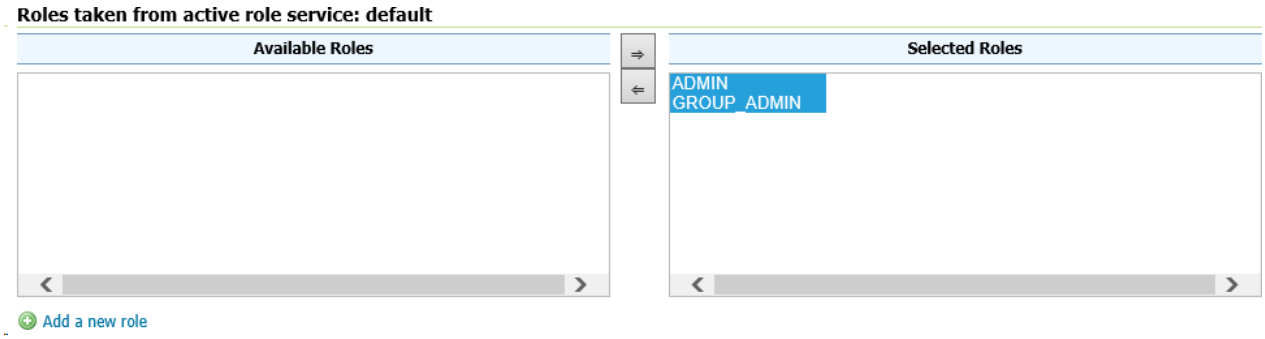



11. Select **Users, Groups, Roles** from the **Security** area in the left column of the administrator page.
12. Select **Add new user** from the **Users, Groups, and Roles** page.
13. Add a new user who is a member of a credential group and save your changes.

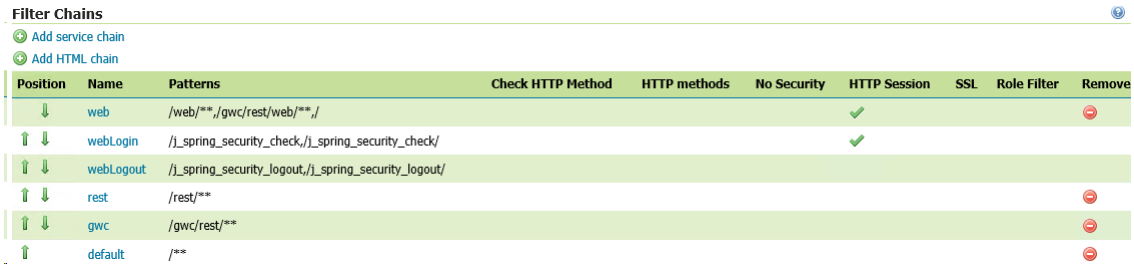
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




14. Move the available roles assigned to the credential user to the **Selected Roles** field.

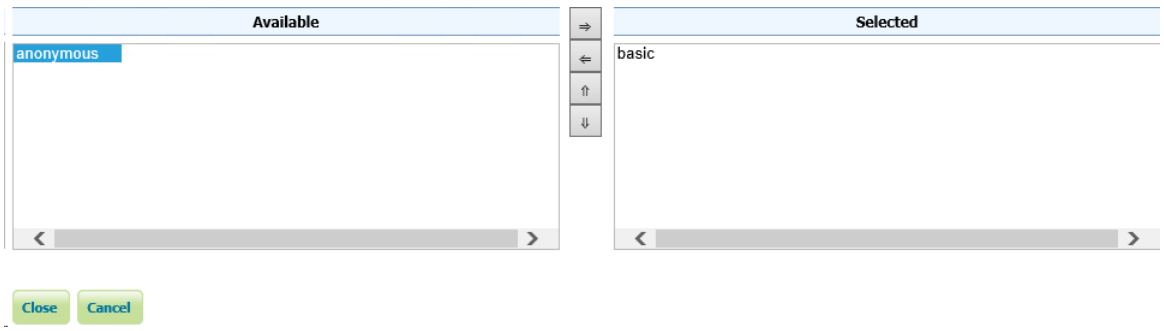



15. Select **Authentication** from the Security area of the administrator web page.
16. Select default from the **Filter Chains** area of the **Authentication** web page.




The **Filter chain** web page opens.

17. Move anonymous" to the **Available** list.




© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Configure Map Sources

The Map app can display map data from different sources. You can configure sources as base maps or as overlays. During run time, the Map app will display the base map as the main map in background and overlays on top of the base map. If you configure multiple base maps, you can switch between them during the run time, but only one base map can be displayed at a time. You can enable and disable multiple map overlays during run time as well.

The properties of each map source must be configured. For more information about configuring each map source, see Map Source Properties.

To configure the Map app, you must complete three major steps:

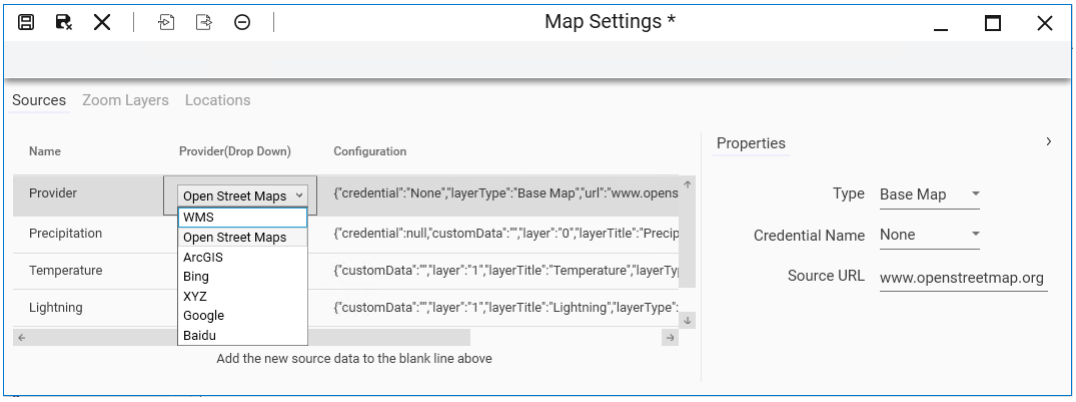
- Add your map sources and configure their properties
- Set minimum and maximum zoom percentages to create zoom layers
- Add graphics to map zoom layers and specify their coordinate locations

After configuring your map sources, you need to set the properties of the Map app. For more information about Map app properties, see Configure the Map Control.

### To assign map sources to a Map app

1. Open the System Platform IDE and select the **Graphic Toolbox** tab to show a list of folders containing graphics .
2. Locate the MapApp in the following folder location within the **Graphic Toolbox**.

   ..._Default Content\4 Apps\OMI Apps
3. Double-click or tap the MapApp listed in the **Graphic Toolbox** view to show the **Map Settings** dialog box.
4. Add map sources.
   a. Select **Sources** beneath the menu bar.
   b. Click or tap the **Provider** field to show a drop-down list of map providers and select a provider.




   The **Configuration** field updates to show parameters that must be assigned values for each data provider. For more information about the properties of each map provider, see Map Source Properties.
   c. Click or tap within the **Name** field to show a data entry field.
   d. Assign a name to the map provider you selected.
   e. Select the row of the map provider whose properties you want to configure.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

f. Assign values to the properties of the map provider listed in the **Properties** area.

The map provider properties listed in the **Configuration** field update to show the properties you selected from the **Properties** field.

g. If required, select the OS group-based credential name from the drop down list of the **Credential Name** field.

**Note**: Some map providers do not require user credentials to access their data. In that case, this step can be ignored.

h. Click or tap the **Name** field to add another row to the **Sources** table.

i. Repeat steps b-h to add all of your map providers to the Map app.

5. Assign zoom levels to your map layers.

A 0 percent zoom level means no zoom, which is a view of the entire planet. A100 percent zoom level is the maximum zoom supported, which shows a map view at the street level.

For more information, see Zoom Layers.

a. Select **Zoom Layers** beneath the menu bar.

b. Click or tap within the **Name** field to show a data entry field.

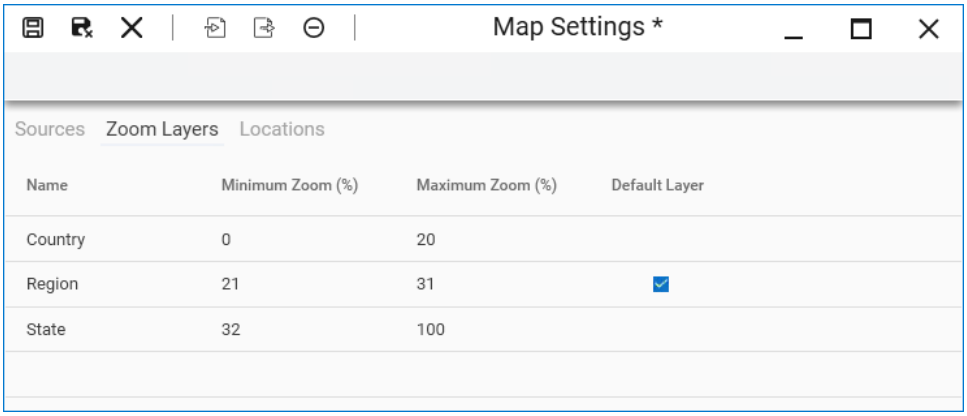
c. Assign a name to the layer.

d. Assign zoom percentage values to the **Minimum Zoom** and **Maximum Zoom** fields.

e. Click or tap the **Zoom Layers** field to add another row to the **Layers** table.

f. Repeat steps b-e to assign zoom level percentages to each map layer.

g. Select the default layer of the map by selecting it in the **Default Layer** column.




6. Add location graphics to the Map app.

For more information about the procedure to add location graphics , see Locations of Map Assets.

a. Select **Locations** beneath the menu bar.

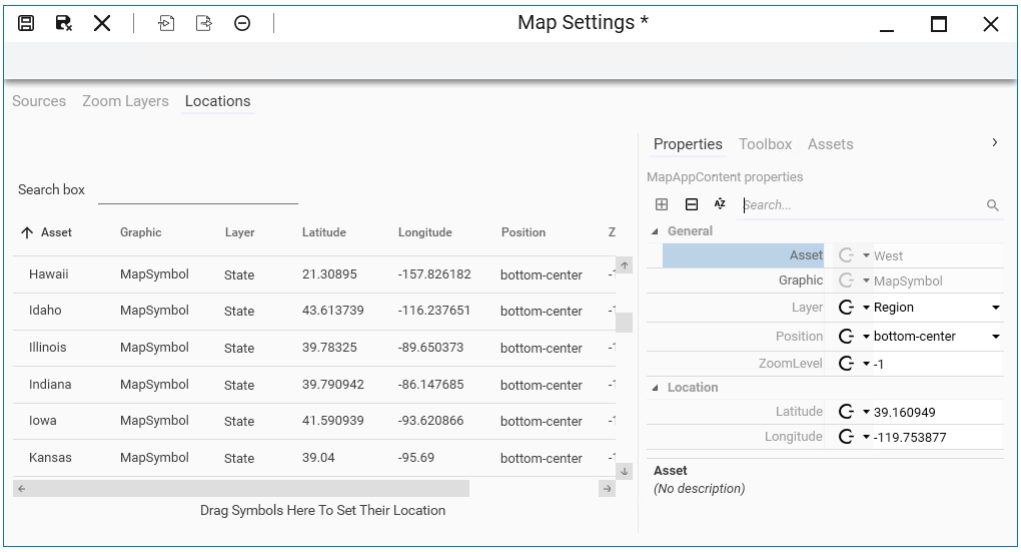
b. From the **Assets** or **Toolbox** tab, drag and drop a graphics on the **Locations** grid.

c. Click the **Layer** column header to show a drop-down list of layers and assign a layer for the graphic.

d. Assign the latitude and longitude of the graphic added to the Map app.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

e. Repeat steps b-d until all geographic graphics have been added to the Map app.




## Map Source Properties

The following tables list the properties of each map data provider supported by the Map app.

**Important**: You may need to set up accounts with some map providers to be able to access the data from their servers. These map providers require an API key or a specific account when you configure map source properties.

**ArcGIS**

| | |
|---|---|
| Type | ArcGIS can provide base maps and map overlays. |
| Source URL | This is the URL for the ArcGIS rest service. For instance: https://sampleserver1.arcgisonline.com/ArcGIS/rest/services/Specialty/ESRI_StateCityHighway_USA/MapServer |
| Opacity | A number between 0 to1 where 0 indicates the overlay will be 100% transparent. 1 indicates the overlay will be 100% opaque. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| Source Layer | Actions to show, hide, include, exclude data from specified source layers. Use a comma delimiter to specify multiple source layers.<br>There are four **Source Layer** actions, which are shown in a drop-down list.<br>  <br>**show**: Only the layers specified in this list will be exported.<br>**hide**: All layers except those specified in this list will be exported.<br>**include**: In addition to the layers exported by default, the layers specified in this list will be exported.<br>**exclude**: The layers exported by default excluding those specified in this list will be exported.<br>The value specified in the field will list the layers by number. The ArcGIS map server will interpret this field. Multiple layers are specified by separating them by commas. For instance, a value of “1,5” selects layers 1 and 5. |

**XYZ**

XYZ is a function of the ArcGIS map provider to add tabular data that contains geographic locations in the form of x,y coordinates to your map. If the table also contains z-coordinates, such as elevation values, you can add tabular data as 3D content into your globe or scene. To add a table of x,y coordinates, the table must contain two fields: one for the x-coordinate and one for the y-coordinate. The values in the fields may represent any coordinate system and units such as latitude and longitude or meters. A field for the z-coordinates that enables 3D geometry is optional.

| | |
|---|---|
| Type | XYZ can provide base maps and map overlays. |
| Source URL | URL for your XYZ server, such as<br>https://server.arcgisonline.com/ArcGIS/rest/services/World_Topo_Map/MapServer/tile/{z}/{y}/{x} |
| Opacity | A number between 0-1 where 0 indicates the overlay will be 100% transparent. 1 indicates the overlay will be 100% opaque. |

**Bing Maps**

| | |
|---|---|
| Type | Base maps are the only type of map data provided by Bing Maps. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| API Key | Registered key to authenticate the Map app to the Bing Maps server providing data.<br>For more information about obtaining an API key, see the Microsoft Web site. At the time of writing, this was the URL: https://www.microsoft.com/maps/create-a-bing-maps-key.aspx |
| Base sources | Base map layer types supported by Bing Maps.<br>**Road** Schematic representation of roads within a geographic area.<br>**Satellite** Orthographic aerial and satellite imagery.<br>**Hybrid** Orthographic aerial and satellite imagery with overlaid roads and labels.<br>You can select one or more base map layer types. During run time, users can select base sources to be shown by the Map app. |

**Google**

| | |
|---|---|
| Type | Base maps are the only type of map data provided by Google. |
| API Key | Registered key to authenticate the Map app to the Google Maps server providing data.<br>For more information about obtaining an API key, see the Google maps platform web site. At the time of writing, the URL was:<br>https://developers.google.com/maps/documentation/javascript/get-api-key |

**Open Street Maps**

| **Property** | **Description** |
|---|---|
| Type | Base maps are the only map data provided by Open Street Maps. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| Source URL | URL of the map server providing base map titles.<br>Even though map tiles provided by Open Street Maps are free, usage restrictions apply to the OSM server at https://openstreetmaps.org. If you use the OSM base map tile server, ensure your usage is in compliance with OSM license requirements. |

**WMS**

| | |
|---|---|
| Type | WMS can provide base maps and map overlays. |
| Source URL | URL for your WMS server, such as https://idpgis.ncep.noaa.gov/arcgis/services/NWS_Climate_Outlooks/ cpc_6_10_day_outlk/MapServer/WMSServer |
| Source Layer | When making a query to retrieve tiles from a WMS server, you must specify a layer, as map provider servers support multiple layers.<br>If you are unsure about the layers available for a specific WMS server, you can query the available layers by entering the following URL on your browser:<br><Source URL> ?request=GetCapabilities&service=WMS<br>This query returns an XML file listing all of the server's capabilities. Under "Capability/Layer" you will find a list of layers. Each layer has a node called "name", this is the layer name that should be specified in this property. |
| Custom Data | This will be sent as custom data for the WMS server. |
| Opacity | A number between 0-1 where 0 indicates the overlay will be 100% transparent. 1 indicates the overlay will be 100% opaque. |

## Zoom Layers

Zoom layers enable you to define a percentage range between the minimum and maximum zoom levels. This range of zoom percentages defines the boundaries of a zoom layer. A symbol assigned to a zoom layer appears when the map is zoomed within that layer's zoom percentage range. Conversely, the symbol is hidden when the map view is outside of the percentage range of the zoom layer containing the symbol.

When defining the location of symbols, you also need to specify at which zoom layer the symbols belong. For example, you can define a zoom layer for the United States map that displays a symbol for each state. At the state zoom layer, you can place your city symbols. During run time, users can show specific information by zooming in or out between different zoom layers.

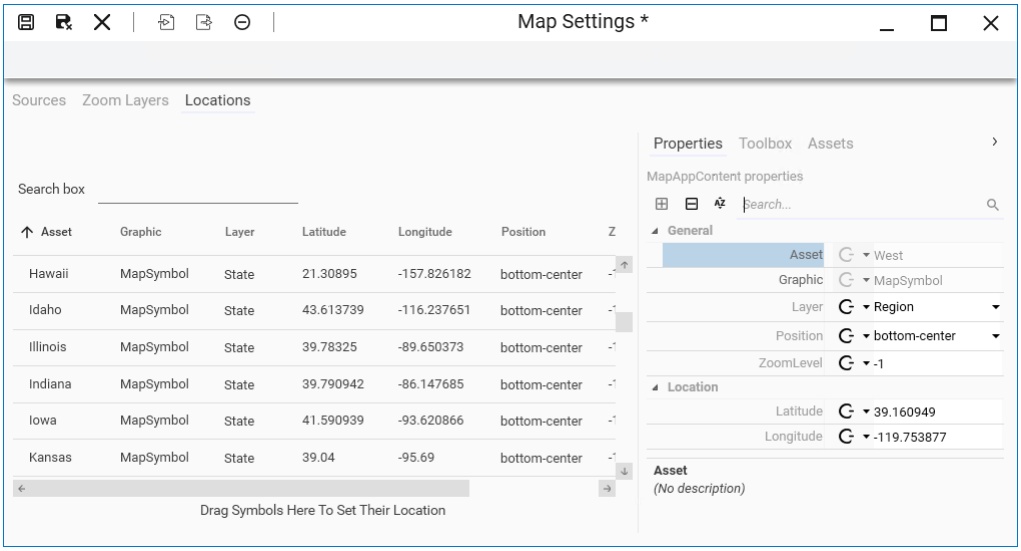
You can specify a layer to be the default zoom layer by right clicking on it and selecting the **Set Default** option. When configuring locations, symbols are initially placed in the default zoom layer.




© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

## Location Assets

You can drag and drop graphics on the **Locations** grid to place them on a map layer at specified coordinates. Each row of the **Locations** grid shows the assigned configuration values of a graphic that will appear on a map during run time.




### To place graphics on a map

1. Select the **Locations** tab from **Map Settings**.
2. Locate the graphic that you want to place on a map from the **Toolbox** or **Assets** tabs.
3. Drag the graphic and drop it in the **Locations** grid area located at the "Drag Symbols Here to Set Their Location" message.

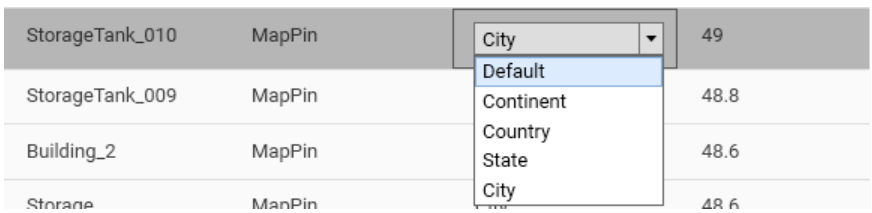
   If you drop a graphic from an asset instance, the **Asset** field shows the name of the asset and the **Graphic** field show the name of the graphic. If you drop a graphic from the **Toolbox** tab, the **Asset** field is empty and the **Graphic** field shows the name of the graphic.

| Asset | Graphic | Layer | Latitude | Longitude |
|---|---|---|---|---|
| Building_1 | MapPin | Default | 0 | 0 |
| | CapperDriver | Default | 0 | 0 |

4. Select the row within the grid where the graphic appears.

   A dark background identifies the selected row.

5. Select the table cell in the **Layer** column of the **Locations** grid to show a list of defined map zoom layers.




© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

This is name of the map zoom layer in which the graphic will be displayed during run time. A graphic is initially assigned to the **Default** zoom layer.

6. Select the zoom layer where you want to place the graphic .
7. Select the **Properties** grid to show fields to specify the latitude and longitude where the graphic will appear on a map.

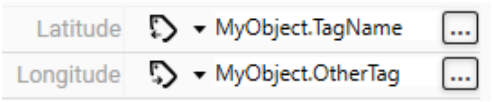
   The center bottom position of a graphic is placed on a map at the specified location.

   Coordinate values can be specified as static values or as dynamic values with binding to a UDA by the position of the **Latitude** and **Longitude** switches.

   **Static Coordinate Values**

   **Dynamic Coordinate Values**

   Static coordinates are specified as:

   - Latitude: +/- 0-90.0
   - Longitude: +/- 0-180.0

   Dynamic coordinates are specified as:

   *Asset_Name.Reference_Name*
8. Enter **Latitude** and **Longitude** values.

   You should see the coordinate values you entered appear in the **Latitude** and **Longitude** columns of the **Locations** grid. Click once in the grid to refresh the grid values.
9. Save your changes.

## Configure the Map Control

You place a map control into a ViewApp by selecting it from the **Toolbox** tab and dragging and dropping it on a layout pane.

---

**Note**: You must configure your map data sources before placing a Map control on a layout pane. See Map Source Properties.

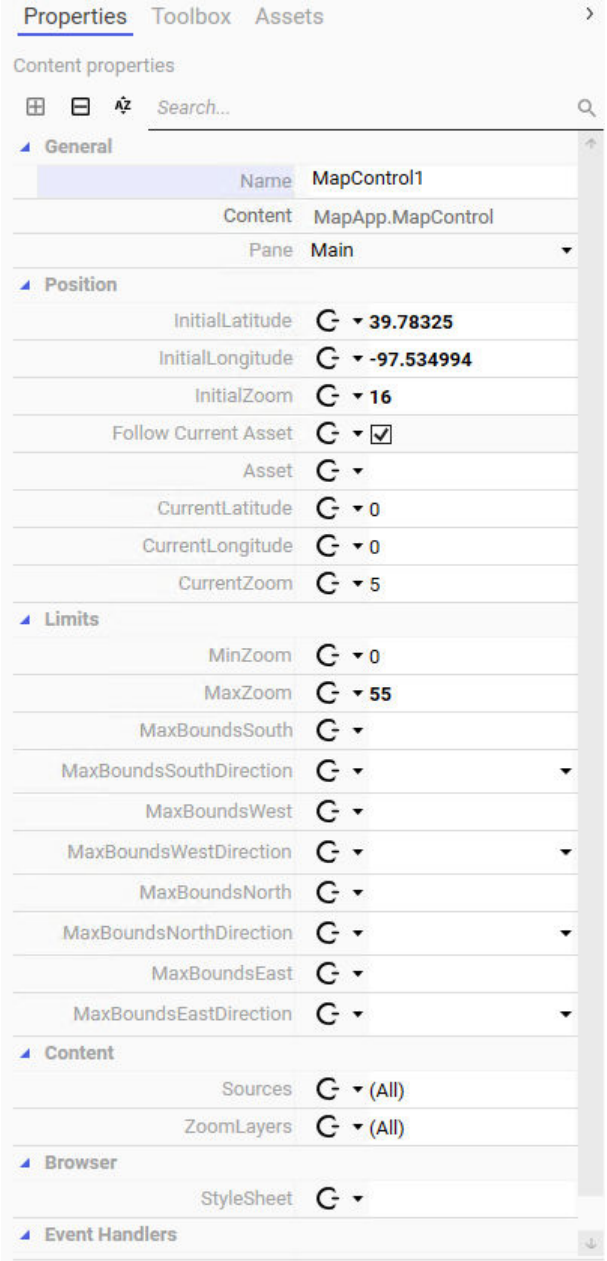
---

### To configure Map app properties

1. Open the Layout Editor or ViewApp Editor.
2. Select the **Toolbox** tab and locate the Map app in the list of controls and graphics.

   ...\Default Content\4. Apps\AVEVA OMI Apps\MapApp
3. Select **MapApp** from the list of AVEVA OMI apps to show the **MapControl** thumbnail graphic beneath the **Toolbox** list of graphics and apps.
4. Drag and drop the **MapControl** thumbnail on a pane of a layout.
5. Select the **MapControl** thumbnail within the pane and select the **Properties** grid to show the app's properties.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




6. Assign a value to each map app property. The following table describes each property.
7. After specifying values to all properties, save your changes to the Map app.

   The following table includes descriptions of Map app properties.You can reset any property to its default value by selecting the arrow before the entry field and selecting **Reset**.

| Property | Description |
|---|---|
| **InitialLatitude** | Latitude of the initial center point map position in decimal degrees. Valid latitude values are +/- 0-90. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| **InitialLongitude** | Longitude of the initial center point map position in decimal degrees.Valid longitude values are +/- 0-180. |
| **InitialZoom** | Zoom level percentage of a map when initially displayed during run time. |
| **LinkCurrentAsset** | Like all AVEVA OMI Apps, the Map app can follow the currently selected asset (context) and will automatically pan and zoom the map to display the asset's location and associated graphic. If you select **LinkCurrentAsset**, map navigation shows the following zoom and location behaviors when an asset is selected:<br>• Centers the map to a selected asset when the map is opened. You can use the assets to navigate within a ViewApp. For instance, you can display all the states and show a marker for each one of them. Then, by selecting a state, from a map, you can set the focus of the ViewApp to a separate pane that shows details about the state.<br>• The map will zoom to the selected asset's zoom layer plus 1 percent.<br>• If no asset is selected or a selected asset is not located on a map, the map shows the initial zoom layer and map center point. |
| **MinZoom** | The minimum zoom percentage in which the map can be zoomed out (0-100%) during run time. |
| **MaxZoom** | The maximum zoom percentage in which the map can be zoomed in (0-100%) during run time. |
| **MaxBoundsSouth** | Latitude of the southern map boundary in decimal degrees (+/- 0-90) to constrain the vertical panning movement of the screen viewport midpoint to the bottom boundary of a map. |
| **MaxBoundsSouthDirection** | Cardinal direction of the south boundary value (S/N). |
| **MaxBoundsWest** | Longitude of the western map boundary in decimal degrees (+/- 0-180) to constrain the horizontal panning movement of the screen viewport midpoint to the left boundary of a map. |
| **MaxBoundsWestDirection** | Cardinal direction of the west boundary value (E/W). |
| **MaxBoundsNorth** | Latitude of the northern map boundary in decimal degrees (+/- 0-90) to constrain the vertical panning movement of the screen viewport midpoint to the top boundary of a map. |
| **MaxBoundsNorthDirection** | Cardinal direction of the north boundary value (S/N). |
| **MaxBoundsEast** | Longitude of the eastern map boundary in decimal degrees (+/- 0-180) to constrain the horizontal panning movement of the screen viewport midpoint to the right boundary of a map. |
| **MaxBoundsEastDirection** | Cardinal direction of the east boundary value (E/W). |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| **Sources** | Map data sources configured in the app's map settings. (All) is the default value, which includes all map data sources specified for the Map app.<br>**Note**: All must be placed within parentheses (All) as a **Sources** property value.<br>If you want to restrict a Map app to show data from only some map sources, use a comma delimited string to specify multiple sources.<br>OSM,Bing,TemperatureOverlay |
| **ZoomLayers** | Map zoom layers configured for the Map app. (All) is the default value, which includes all zoom layers specified for the Map app.<br>**Note**: All must be placed within parentheses (All) as a **ZoomLayers** property value.<br>If you want to restrict a Map app to show data from only some zoom layers, use a comma delimited string to specify the zoom layers by name.<br>country,state,city |
| **Style Sheet** | Sets the Cascading Style Sheet (CSS) for the map webpage. |

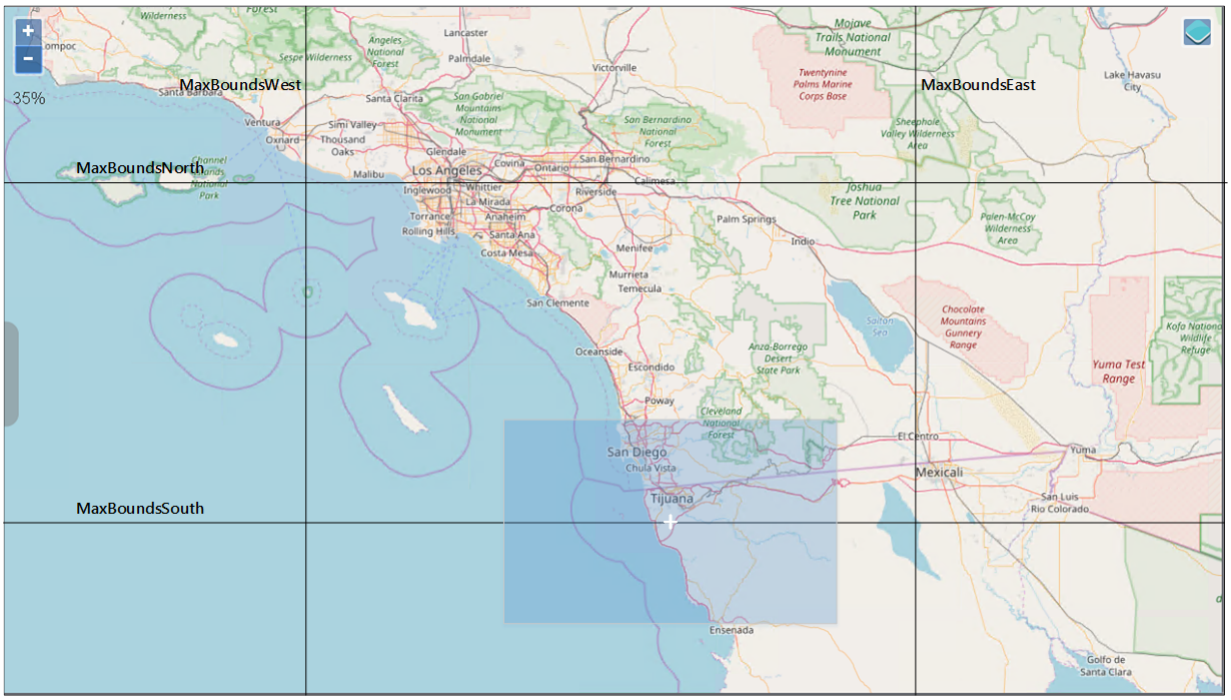
## More Details on Bounding Box Properties

Together, the MapApp's MaxBounds directional properties construct a bounding box to restrict the viewable area within a map that can be shown by user's screen viewport, regardless of the map zoom level.




Rather than restrict the viewable area of a map to the area strictly within the bounding box, the MapApp enables users to extend the screen viewport to its center point beyond the borders of the bounding box.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




When a zoom level is set to a very low percentage to show the maximum map area, a bounding box does not significantly reduce the viewable map area because moving the center of the screen viewport to the border of a bounding box will likely show the majority of the map.

Specify zoom level percentage ranges of the layers of your map to minimize the amount of zooming or panning required to see the entire area within the bounding box. Set the zoom percentage layer ranges more narrowly to be able to show assets at different map layers with reduced zooming and panning.

# Graphic Limitations of Graphics in a Map App

The MapApp can show Industrial Graphics on a map. The MapApp relies on an HTML5 rendering engine to show the mapped Industrial Graphics. The HTML5 engine has some limitations and does not fully support all Industrial Graphics properties or animations.

This topic describes all known limitations of the HTML5 engine when it renders Industrial Graphics properties or animations. The HTML5 rendering engine will be enhanced in subsequent product releases to provide additional support for graphic properties and animations.

## Properties Supported by all Graphic Elements

The following graphic element properties are supported by all graphicsthat appear in a MapApp.:

- Angle
- X
- Y
- Width
- Height
- Start

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- End
- Enable
- Visible
- AbsoluteAnchor
- RelativeAnchor
- Transparency
- ElementStyle
- OwningObject
- Custom Property Overrides

**Note**: The ElementStyle property enables users to select a defined element style and apply it to a graphic element or animation. An element style includes color properties like FillColor, LineColor, or UnFilledColor, which are unsupported by the HTML5 rendering engine. These limitations still apply if you select an element style that contains unsupported color properties.

## Properties Supported by All Graphic Elements With Some Limitations

The following table lists the properties of graphic elements that can be incorporated in a MapApp with some HTML5 rendering limitations.

| Graphic Element Property | Property Limitations |
|---|---|
| FillColor | The Pattern and Texture properties are not supported. |
| UnFilledColor | The same gradient color limitations of the FillColor property apply to the UnFilledColor property. There is no support for the Pattern and Texture properties. |
| LineColor | The Pattern and Texture properties are not supported. |
| Font | A Map app only supports the Font, Size, and Bold or Regular Font Style options of the For property. |
| TextColor | Only the Solid Color option of the TextColor property is supported. |
| FillOrientation | RelativeToScreen is not supported. |
| FillBehavior | Will always be set to Both. |

## Supported Graphic Elements and Additional Properties

The following table lists the graphic elements that can be incorporated with some limitations. Any graphic element not listed in this table is not supported.

The table includes a column that lists any limitations of the supported graphic element properties. When using graphics that incorporate color properties, the colors have the same limitations applicable for FillColor, LineColor, and other related graphic properties.

| Graphic Elements | Supported Properties | Limitation Notes |
|---|---|---|

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | | |
|---|---|---|
| Rectangle<br>Rounded Rectangle<br>Ellipse<br>Closed Polygon<br>2 Point Pie<br>3 Point Pie<br>Closed Curve<br>Path<br>2 Point Chord<br>3 Point Chord | **Fill Style**:<br>HorizontalDirection<br>HorizontalPercenFill<br>VerticalDirection<br>VerticalPercentFill<br>**Line Style**:<br>LineWeight<br>LinePattern | No Limitations |
| Line<br>Polyline<br>Curve<br>2 Point Arc<br>3 Point Arc<br>Connector | **Line Style**:<br>LineWeight<br>LinePattern<br>StartCap<br>EndCap | StartCap: Only Flat is supported.<br>EndCap: Only Flat is supported. |
| Button | ButtonStyle<br>Text<br>Word Wrap<br>FillOrientation<br>FillColor<br>Alignment | ButtonStyle: Only Standard button style is supported.<br>Word Wrap: Any caption that exceeds the button width will be truncated.<br>FillOrientation: Only RelativeToGraphic is supported<br>FillColor: Only Solid color is supported. If you have gradients with multiple colors selected, they will be converted to a single color using the first color.<br>Alignment: Only Centers alignment is supported. |
| Text | Caption<br>Alignment | Alignment: Only left-top supported. |
| Image | HasTransparentColor<br>TransparentColor<br>ImageStyle | ImageStyle: Only Stretch is supported. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | | |
|---|---|---|
| Text Box | Text<br>TextFormat<br>WordWrap<br>LineWeight<br>LinePattern<br>Alignment<br>Font | WordWrap: Only the True option is supported. |
| Status | Graphics<br>Expression | Status Style: Only Default configuration is supported. |
| Web Alarm Client (EAC) | Alarm Mode<br>SAL Graphics<br>Column Details<br>Queries and Filters<br>Time Settings<br>Run-Time Behavior | **Alarm Mode**<br>• Client Mode: Only supports Current Alarms, Recent Alarms and Events.<br>• Alarm Query: Supports InTouch and ArchestrA alarms<br>• Use Default Ack Comment: Only supports comments showing Alarms and Events.<br>SAL Graphics: SA_Alarm_RuntimePage and SA_Alarm_RuntimeBanner are not supported.<br>Column Details: Does not support sorting.<br>Queries and Filters: Only supports selected Query and Filter at design time. Does not support runtime selection of different query or filter. Does not support relative references in alarm query.<br>Time Settings: Not supported.<br>Run-Time Behavior: Only supports show heading, show grid and allow column resizing. Does not support Ack, Shelve, Unshelve, Hide, Unhide, and Freeze operations.<br>**Note**: WindowViewer must be running to view InTouch or Application Server alarms.<br>**Note**: Does not support embedded alarm client's methods or properties. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | | |
|---|---|---|
| Web Trend Client | Pens<br>Appearance<br>Options | **Pens**<br>Does not support historical data backfill.<br>Only supports Show, Pen Name (As description), Expression or Reference<br>Pen Details: Min, Max<br>Pen Options: Color Plot type(all will be treated as Line)<br>**Appearance**<br>PlotArea: Single tag mode,Grid (Show vertical grid, show horizontal grid, Color)<br>X time axis:Show cursor(Cursor1:Color), Number of values<br>Y value axis:Number of values, Value axis label (Multiple Scales,Single Scale)<br>**Options**<br>Only supports Retrieval:Trend Duration<br>**Historical Sources**: Not Supported<br>**Data Binding**: Not Supported<br>**Event**: Not Supported<br>**Note**: Does not support the Trend Client's methods and properties. |
| Trend Pen | Data Source | Does not support historical data backfill.<br>Trend time Period: Does not support Fixed Type. |
| Connection Point | | Size Property: Is not supported<br>Will not be displayed if no connector is using it. |

## Supported Animations

The following table lists animations supported by the Map app. When using animations that incorporate color properties, the selected animation colors have the same limitations applicable for FillColor, LineColor, and other related graphic element properties. Furthermore, the HTML5 rendering engine does not support writing values. Any type of animation that updates attribute or custom property values is not supported.

**Note**: The following table lists only supported animations. Any animations not listed are not supported by the MapApp.

| **Animation** | **Limitations** |
|---|---|

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| Alarm Border | Alarm Border animation shows an alarm border around a graphic element whose visible appearance represents the graphic element's alarm severity and acknowledgement status. The appearance of each alarm border is defined by an associated element style. Not all element style properties are supported. For instance, if Gradient is specified as the value of an element style's Line Color Override option in an alarm border element style, it will not be supported. |
| Element Styles | Refer to the graphic elements limitations regarding color, line, and font. The same limitations applicable to graphic elements also apply to Element Style animation.<br>Expression Or Reference: Time and Elapsed Time are not supported.<br>Style only gets refreshed when changes are made in the Galaxy Style Library and the ViewApp is redeployed. |
| Visibility | No limitations. |
| Fill Style<br>Line Style<br>Text Styles | Refer to graphic element limitations regarding color, line, and font. The same limitations applicable to graphic elements also apply to Element Style animation.<br>Expression Or Reference: Time and Elapsed Time states are not supported.<br>TextStyle: Text Style animation cannot be applied to CheckBox or ComboBox graphic elements. |
| % Fill Horizontal<br>% Fill Vertical | Orientation: only Relative to Graphic is supported. |
| Slider Horizontal<br>Slider Vertical | Does not support CursorAnchor.<br>WriteData:only On Mouse Release is supported when writing to a custom property.<br>Does not support ShowTooltip |
| Width<br>Height | Origin is not a supported value of the Anchor property. |
| Orientation | The Relative Anchor or RelativeOrigin are not supported when setting Orientation animation. (Only supported anchor position is Center). |
| Value Display | Text Format: If you specify integer attributes in an expression, no decimal points appear in the formatted number.<br>States: The Time and Name states are not supported. |
| Disable | The RadioButton graphic element does not support the Disable Aimation option. |
| Point | Point animation is not supported by the Curve and ClosedCurve graphic elements. |
| Tooltip | A MapApp does not support Tooltip animation. An InTouch Web Client supports Tooltip animation except for Image,Radio Button, Button, and Tex graphic elements. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| Action Scripts | Actions scripts are supported except for functions that invoke dialogs.The exception is the ShowGraphic animation, which will replace the current graphic by the one specified in the call.<br>Tooltip animation is not supported on a grouped or embedded graphic. |
| ShowSymbol | Title: Only supports the default option.<br>Type: Supports Modal and Modeless when the Close button option is selected.<br>Position: Only supports Center when the Client Area x and y values are 0,0.<br>Size: Only supports the Relative to Symbol option.<br>Shortcut: Not supported. |
| Blink | Group and embedded graphics are not supported. |
| Push Button | Only supports binding with a custom property. In various states the push button animation supports different actions:<br>• States: Boolean; Action: Only supports Toggle<br>• States: Analog; Action Only supports Toggle/Increment/Decrement/Multiply/Divide; Send Value: "Continuously while button is pressed" not supported<br>• States: String; Action: Direct/Set not supported; Send Value: "Continuously while button is pressed" not supported<br>Shortcut: Is not supported. |

## Major Unsupported Industrial Graphic Features

The HTML5 rendering engine will be enhanced with each product release. The following list summarizes the current major limitations of the current HTML5 rendering engine.

- Setting graphic properties using a script: Only the following properties are supported for reading or writing to a graphic element property using a script:
  - Position (X,Y)
  - Angle
  - Size(Height,Width)
  - Angle
  - StartAngle
  - SweepAngle
  - Text
  - Visible
  - Transparency
  - ElementStyle
- Graphic Library

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

Several graphics in the Industrial Graphics library incorporate graphic elements or color settings that are not yet supported by the HTML5 rendering engine.

- Writing values

  The current HTML5 rendering engine cannot write values back to graphic or animation properties. All graphics that appear on a map are read only.

- Multiple ViewApps on the same node

  The Map App retrieves map content and graphics from a web server. The web server starts on demand when the first ViewApp loads the Map control.

  If changes are made to a graphic when running multiple ViewApps simultaneously, the ViewApp that started the web server must be deployed. Otherwise, the ViewApps do not show the graphic updates during run time.

## Map App Enhancements

The Map App includes several enhancements that make it easier to add map pins to a map using an action script and the ability to display assets on a map by zoom levels.

### Map App Scripting Support

You can dynamically add pins to a map displayed by the Map App using an action script. The AddContent() function has been added to the Map App.

`MyContent.MapControl1.AddContent(`*Map_information*`)`

Action script to add one map pin to a Map.

```
' Use "AddContent" to add one map pin for US
dim usMapInfo = new aaGraphic.GraphicInfo;
usMapInfo.GraphicName = "MECRE_KSA.zMAP_ICON_Bottom_Left_3";
usMapInfo.Identity = "US_MapPin1";
usMapInfo.Latitude = 35.99;
usMapInfo.Longitude = -97.99;
' Support MaxZoom/MinZoom
usMapInfo.MinZoom = 15;
MyContent.MapControl1.AddContent(usMapInfo);
```

As MinZoom=15 in runtime the map pin will only appear if the minimum zoom level is 15. If the MaxZoom is also set then the map pin will only appear between the MinZoom and MaxZoom values.

Action script using an array to add multiple map pins to a map.

```
' Use "AddContent" with array parameter to add two map pins for Asia
dim asiaMapInfo1 = new aaGraphic.GraphicInfo;
asiaMapInfo1.GraphicName = "MECRE_KSA.zMAP_ICON_Bottom_Left_3";
asiaMapInfo1.Identity = "ASIA_MapPin1";
asiaMapInfo1.Latitude = 30.42;
asiaMapInfo1.Longitude = 149.46;
dim asiaMapInfo2 = new aaGraphic.GraphicInfo;
asiaMapInfo2.GraphicName = "MECRE_KSA.zMAP_ICON_Bottom_Left_3";
asiaMapInfo2.Identity = "ASIA_MapPin2";
asiaMapInfo2.Latitude = 35.42;
asiaMapInfo2.Longitude = 149.46;
dim asiaMapInfo[2] = as aaGraphic.GraphicInfo;
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

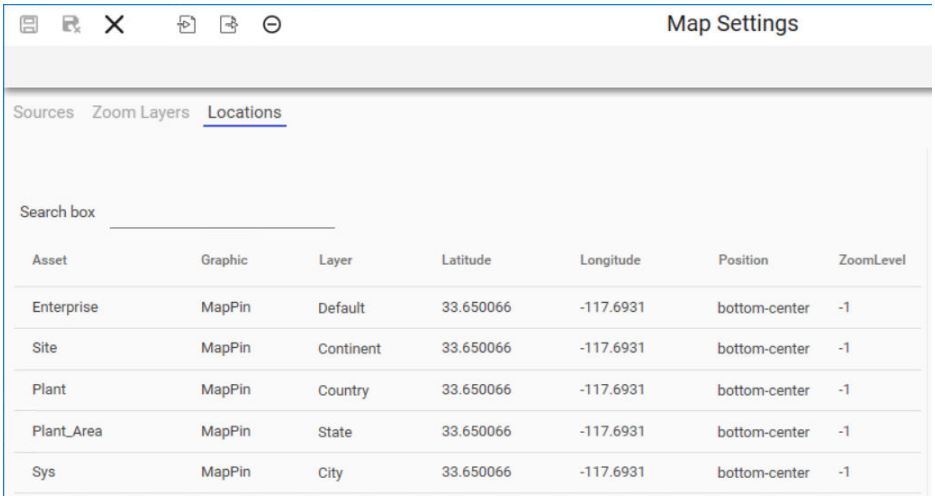
```
asiaMapInfo[1] = asiaMapInfo1;
asiaMapInfo[2] = asiaMapInfo2;
MyContent.MapControl1.AddContent(asiaMapInfo);
```

Action scripts can include the Set zoom level range to show or hide map pins that are added.

You can dynamically remove a pin from a map displayed by the Map App using an action script and the RemoveContent() function. You can also use the ClearAllContents() function to clear all the pins added using the AddContent() function. The RemoveContent() allows you to remove one map pin at a time while the ClearAllContents() function will clear all the pins in one function call.

## Map App Zoom Level Enhancements

The map zoom levels for an asset can be set from the **Locations** tab of the Map app.




If an asset has been assigned a zoom level of -1, the map will follow the current zoom level. If the assigned zoom level exceeds the maximum zoom level of the map, the map will be assigned the maximum zoom level of the map.

## Current Limitations of the MapApp Widget

| Element | Limitations |
|---|---|
| MapApp widget script statements in the form:<br>`MyContent.<MapControlName>.AddContent(info)` | Limited by the lack of layout scripting support. The and RemoveContent functions only work correctly MapApp control running in AVEVA OMI ViewApps. |
| MapApp script statements in the form:<br>`Support <WidgetName>.AddContent()` | Limited by the lack of support in an OMI runtime e which does not support the MapApp widget. The A and RemoveContent functions are only supported WebClient. |
| MapApp widget script statements in the form:<br>`<WidgetName>.RemoveContent(),`<br><br>and MapApp control script statements in the form:<br>`MyContent.<MapControlName>.RemoveContent(info)` | Do not support a reference value for the identity.<br><br>Only support removing the map pin added using th AddContent() function. Locations added using the will not be removed. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Export and Import Map Source Data

The Map app includes separate import and export utilities to be able to transfer your map source data. **Import** and **Export** buttons appear on the menu bar of the **Map Settings** dialog box.



Both the import and export utilities use a comma-delimited CSV file to save the map source data. You can edit the file with Excel or text editors. When you export map source data, you must select a folder location where the export CSV file should be saved. Likewise, you must navigate to the folder containing the CSV file when you want to import the contents of the file to **Map Settings**. You see a message after your map settings file was successfully imported or exported.

The import/export file contains separate sections for the data specified in the tabbed **Sources**, **Zoom Layers**, and **Locations** areas of the **Map Settings** dialog box. Each section shows how the map source data should be ordered within a row, which corresponds to the order of the grid column headings. For example, the **Sources** section of the file shows the sources map data should be ordered as:

Name, Provider, Configuration

which correspond to the grid column headings of the **Sources** area.

```
Created on: 3/7/2017 7:17:49 PM

:SOURCES

:Name,Provider,Configuration

OSM,Open Street Maps,"{""layerType"":""Base Map"",""url"":""openstreetmaps.org""}"

Bing,Bing,"{""aerial"":false,""aerialWithLabels"":false,""apiKey"":""An6Grh5_YKz-
_CYnREoNn3nOaBU_rlnVEoc7o8HpSj3GWCvjseEguPvN3rJkZ95T"",""colinsBart"":false,""layerType"":"
"Base Map"",""ordnanceSurvey"":false,""road"":false}"

WMS,WMS,"{""customData"":"""",""layer"":"""",""layerTitle"":""WMS"",""layerType"":""Overlay
"",""opacity"":"""",""url"":""""}"

:LAYERS

:Name,MinZoom,MaxZoom,AssetsQuery,NavZoom,Default

Continent,0,8,,,False

Country,5,16,,,True

State,14,31,,,False

City,29,99,,,False

:LOCATIONS

:Asset,Graphic,Graphictype,Layer,Mode,Latitude,Longitude,NavigationZoom,Position

Building_1,MapPin,Symbol,State,Static,37,-122,,Center

Building_2,MapPin,Symbol,State,Static,34,-118,,Center

Building_3,MapPin,Symbol,State,Static,32,-117,,Center

Storage,MapPin,Symbol,Continent,Static,39,-98,,Center
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

```
StorageTank_001,MapPin,Symbol,City,Static,37.1,-122.1,,Center
StorageTank_002,MapPin,Symbol,City,Static,37.11,-122.11,,Center
StorageTank_003,MapPin,Symbol,City,Static,37.12,-122.12,,Center
StorageTank_004,MapPin,Symbol,City,Static,37.13,-122.13,,Center
StorageTank_005,MapPin,Symbol,City,Static,37.14,-122.14,,Center
StorageTank_006,MapPin,Symbol,City,Static,37.15,-122.14,,Center
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

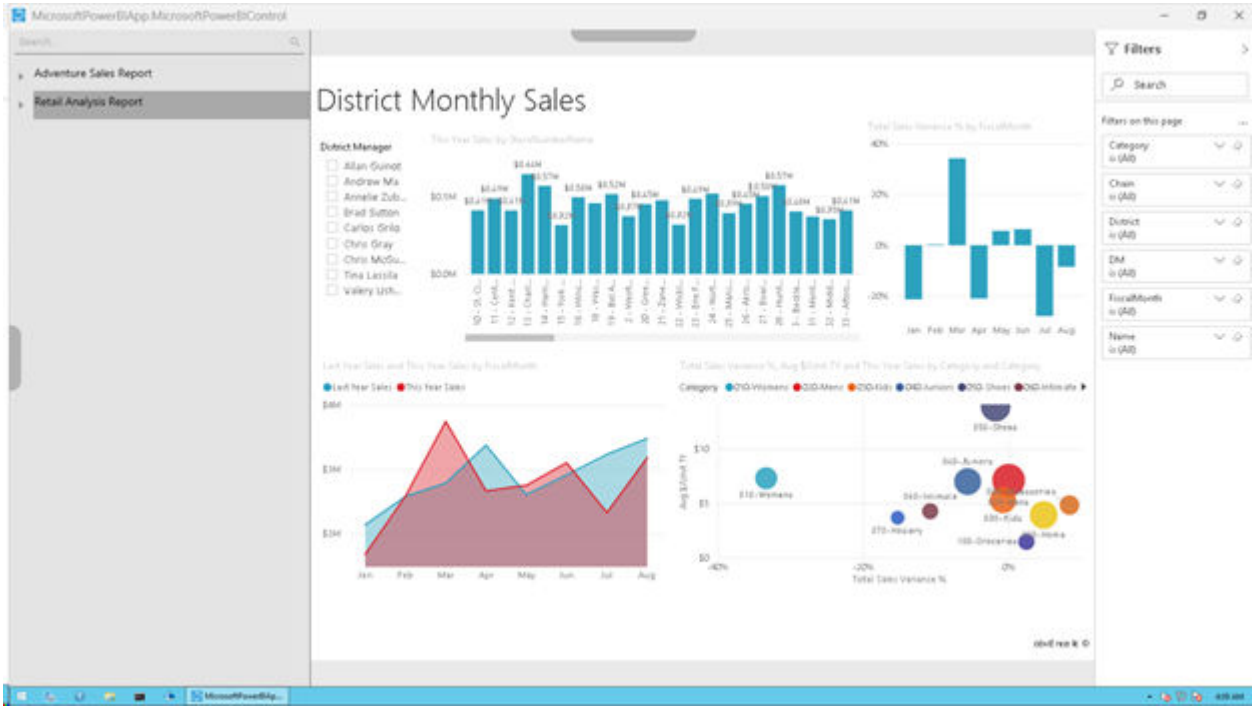
# AVEVA™ OMI App for Microsoft Power BI - Flex License Only

**Note:** The AVEVA OMI App for Power BI requires an AVEVA Flex license. It is not included in the product installation. If you have a Flex license, you can follow the instructions in How to download an app to download the application.

Microsoft® Power BI is a suite of software services, apps, and connectors that aggregate unrelated sources of data to produce business analytic reports that appear in a web dashboard. Power BI bases a report on a single dataset.

Power BI designers create graphic representations of selected data shown on the dashboard based on a set of integrated filters. Power BI graphic visuals are dynamic and update as the underlying data changes or different runtime filters are applied.

The AVEVA™ OMI App for Microsoft Power BI enables a Power BI report to be shown within a layout pane of a running ViewApp. Hereafter, the AVEVA™ OMI App for Microsoft Power BI is referred to as the Power BI app.




Power BI app properties can be configured to show an assigned default page of a Power BI report or show a report from the selected node of the ViewApp shown in the navigation pane on the left. Also, a Power BI app property can be set to show or hide the Filter area on the right.

The Power BI app also provides scripting capability to filter report data from a range of data or by date and time.

### Using the AuthenticationProviders Security Mode

A new authentication mode, AuthenticationProviders, has been added in System Platform 2023. App developers can override this setting to allow multiple authentication modes for their custom apps. However, the authentication mode must be explicitly set for the app. See WebControls SDK in the *OMI SDK Help* for more information.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

When AuthenticationProviders security mode in implemented, the Power BI app does not necessarily follow the security mode implemented by the ViewApp, which uses the security mode set in the System Platform IDE. As a result, users may see their Azure AD credential shown in the pane that contains the Power BI app, but their Kerberos credentials will be shown for the ViewApp logged-in user.

## How to Download and Install the Microsoft Power BI App

If you have an AVEVA Flex license, you can download the Microsoft Power BI app from the AVEVA Product Hub, then install it. Follow the procedures below.

### To download the Microsoft Power BI app

1. Open the System Platform IDE.
2. From the **Home** ribbon, select **Galaxy**, then **Import**.
3. Select **Objects**,then **Explore product hub**.

   **Note:** You can also go directly to the Product Hub using this URL: https://softwaresupportsp.aveva.com/#/producthub
4. On the Product Hub, for **Product**, select **System Platform**.
5. For the **Download Type**, select **Add On**.
6. From the list, select the the Microsoft Power BI app.

The app is downloaded as a .exe file which includes a .aaPKG file containing the app itself, a PDF User Guide for the app, and an HTML ReadMe file with additional information.

### To install the Microsoft Power BI App

1. Double click the AVEVA OMI App for Microsoft Power BI.exe file to extract its contents. Select a destination folder that is accessible from the System Platform IDE.
2. In the System Platform IDE, from the **Home** ribbon, select **Galaxy**, then **Import**.
3. Select **Objects**, then **From package**.
4. Browse to the location of the .aaPKG file, select the file, and select **Open**.
5. On the **Import preferences** dialog box, leave the default selections and select **Import**.

This imports the application at the root level of the Visualization folder. You can drag it to any desired location in the Visualization folder.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Configure the Power BI App

Preparing the Power BI app to run in an AVEVA ViewApp includes several major workflows that must be completed by both Power BI designers and ViewApp builders. The primary focus of this User Guide is to describe the work done by the ViewApp builder to integrate the Power BI app in System Platform.

The following list shows the expected workflow sequence to prepare the Power BI app for use and the expected user role to complete each workflow.

1. Create and publish Power BI report (Power BI designer)

   Have a Power BI report published for use with the Power BI app. If necessary, contact your organization's Power BI designer to publish a Power BI report before starting the workflows completed by a ViewApp builder.

   **Important**: To embed a Power BI report in the AVEVA Power BI OMI app, the Power BI report must be published using the "Embed for your customers application" method.

   If your organization is new to Microsoft Power BI, see Create and Publish a Power BI Report for instructions to create a report. These instructions are intended primarily for users to quickly start using the Power BI app together with Power BI reports for evaluation purposes. However, creating a Power BI report is done entirely using Microsoft products. The procedure to create a report may change as Microsoft updates their products, which is beyond the scope of AVEVA publications to provide continuous updates for other company's software products.

2. Create a named credential for the Power BI report (ViewApp builder)

   See Create a Named Credential for a Power BI Report.

3. Configure Power BI app properties (ViewApp builder)

   See Power BI App Properties.

## Create a Named Credential for a Power BI Report

Power BI requires a security credential to permit a report to be shown while a ViewApp is running. Creating a credential is the responsibility of a ViewApp builder.

A Power BI designer must provide Power BI report information to a ViewApp builder. The following table lists the information needed from a Power BI designer. The procedure to create a credential includes steps to enter Power BI report information in credential fields.

| Credential Components | Power BI Report Information |
|---|---|
| Username | Client ID |
| Domain Name | Tenant ID |
| Password | Client secret value |

For the procedure to create a System Platform credential, see Manage Credentials in the System Platform OMI online help. When creating the credential, choose the "Domain, UserName,and Password" type of credential.

Proceed to the next workflow in this chapter to configure Power BI app properties. You will need the name of the credential you created in this workflow and the Workspace and Report IDs you created when publishing a Power BI report.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

## Configure Power BI App Properties

Power BI app properties can be shown in the Layout or ViewApp editors by placing the Power BI app on a layout pane. After selecting the app on a pane, its properties appear on the **Properties** page by functional groups.

To assign values to the Power BI app properties, you will need the following:

- Name of the security credential created for the Power BI report
- Workspace ID created when publishing a Power BI report
- Report ID created when publishing a Power BI report

If any property is assigned an invalid value, an error message appears when the Power BI app initially loads at runtime.




For more information about the error, see the System Platform logger.

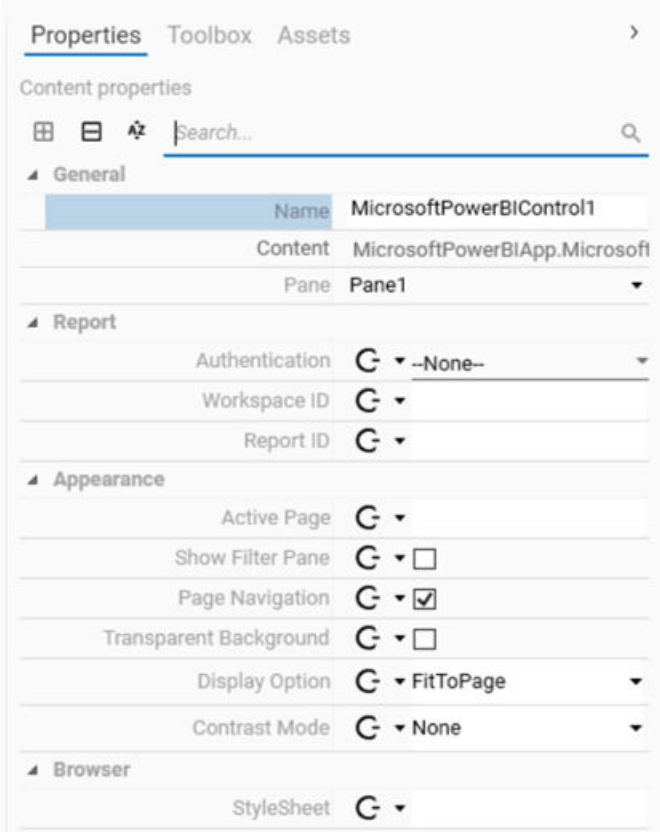
### To configure Power BI app properties

1. Open the Layout or ViewApp Editor and select the **Toolbox** tab.
2. Open the folder in the **Toolbox** where the Power BI app was placed when it was imported.
3. Select the Power BI app.
4. Drag and drop the Power BI app thumbnail onto a layout pane.
5. Select the Power BI app thumbnail and select the **Properties** tab.

   The **Properties** tab shows the properties of the Power BI app. The following screen capture shows the default values assigned to Power BI app properties.

   For more information about Power BI app properties, see Power BI App Properties.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




6. Assign values to properties and save your changes.

## Power BI App Properties

The following table shows Power BI app properties that must be assigned values during the configuration of the app.

All Power BI app properties can be bound to a reference in a ViewApp as a:

- namespace attribute
- object attribute
- my content attribute
- compound expressions

A Power BI report must have been previously published to obtain the following information to assign values to Power BI app properties:

- Power BI app Authentication property (credential)
  - Client ID
  - Tenant ID
  - Client secret value
- Power BI app Workspace ID property
  - Unique ID of the workspace where Power BI reports are published

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- Power BI app Report ID property
  - Unique ID of the Power BI report to be shown by the Power BI app.

<table>
<tr><th colspan="2">Report Properties</th></tr>
<tr><td>Authentication</td><td>The Authentication property shows a list of available named credentials that store the Client ID, Tenant ID, Client Secret Value of published Power BI reports.<br><br>The named credential must be configured of type "Username, password and DomainName". The following list shows the mapping of Power BI report properties to a credential's username, password, and domain name:<br><br>User name = Client ID<br><br>Domain name = Tenant ID<br><br>Password = Client Secret Value<br><br><table><tr><th>Data Type</th><th>Default Value</th><th>Read-Write Mode</th><th>Runtime Property</th><th>Layout Scriptable</th></tr><tr><td>String</td><td>Empty</td><td>Read/Write</td><td>Yes</td><td>Yes</td></tr></table></td></tr>
<tr><td>Workspace ID</td><td>Unique ID of the workspace where Power BI reports are published. The Workspace ID appears as part of the URL when the published report is displayed in a web browser.<br><br>Shows a validation error in the property grid if the configured WorkSpace ID is an invalid GUID or longer than the maximum character length, which is 36 characters including hyphens.<br><br><table><tr><th>Data Type</th><th>Default Value</th><th>Read-Write Mode</th><th>Runtime Property</th><th>Layout Scriptable</th></tr><tr><td>String</td><td>Empty</td><td>Read/Write</td><td>Yes</td><td>Yes</td></tr></table></td></tr>
<tr><td>Report ID</td><td>Unique ID of a Power BI report. The Unique ID appears as part of the URL when the published report is displayed in a web browser.<br><br>Shows a validation error in the property grid if the configured Report ID is an invalid GUID or longer than the maximum character length, which is 36 characters including hyphens.<br><br><table><tr><th>Data Type</th><th>Default Value</th><th>Read-Write Mode</th><th>Runtime Property</th><th>Layout Scriptable</th></tr><tr><td>String</td><td>Empty</td><td>Read/Write</td><td>Yes</td><td>Yes</td></tr></table></td></tr>
<tr><th colspan="2">Appearance Properties</th></tr>
</table>

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

<table>
<tr><td>Active Page</td><td>Sets the active page displayed by the Power BI report as well as when the user changes the displayed page by a mouse click or touch gesture during runtime. The page selected by the user is written to the Active Page property as if it were bound to a reference in Write or Read/Write mode.<br><br>This property can be used to show a selected page when the Page Navigation is disabled (which results in hiding of the pages of a report).<br><br>If the configured name of the page is not present in the Power BI report, or if it is not configured, the app defaults to showing the page that is set as an active page at the report level by the Power BI administrator.<br><br>Users can change the active report page shown by the Power BI report by using data binding or layout scripts in the Power BI app.
<table>
<tr><th>Data Type</th><th>Default Value</th><th>Read-Write Mode</th><th>Runtime Property</th><th>Layout Scriptable</th></tr>
<tr><td>String</td><td>Empty</td><td>Read/Write</td><td>Yes</td><td>Yes</td></tr>
</table></td></tr>
<tr><td>Show Filter Pane</td><td>Determines whether the Filter pane of the Power BI report is displayed or not. When set to true, the Filter pane appears in the report.
<table>
<tr><th>Data Type</th><th>Default Value</th><th>Read-Write Mode</th><th>Runtime Property</th><th>Layout Scriptable</th></tr>
<tr><td>Boolean</td><td>False</td><td>Read/Write</td><td>Yes</td><td>Yes</td></tr>
</table></td></tr>
<tr><td>Page Navigation</td><td>Determines whether the ViewApp Navigation pane is displayed or not. When set to true, the Navigation pane appears in the report. When set to false, the active page displayed in the report is set by the value of the Active Page property.
<table>
<tr><th>Data Type</th><th>Default Value</th><th>Read-Write Mode</th><th>Runtime Property</th><th>Layout Scriptable</th></tr>
<tr><td>Boolean</td><td>True</td><td>Read/Write</td><td>Yes</td><td>Yes</td></tr>
</table></td></tr>
</table>

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

<table>
<tr><td>Transparent Background</td><td>By default, the background of the embedded content is white with gray margins. If you prefer to use a different background, you can give the embedded content a transparent background. Then, you can apply the style you want to the HTML div element that contains the embedded content. The div element's styling then becomes visible.
<table>
<tr><th>Data Type</th><th>Default Value</th><th>Read-Write Mode</th><th>Runtime Property</th><th>Layout Scriptable</th></tr>
<tr><td>Boolean</td><td>Empty</td><td>Read/Write</td><td>No</td><td>No</td></tr>
</table></td></tr>
<tr><td>Display Option</td><td>Controls the display of a report page within the dimensions of the pane in which the Power BI app has been placed.<br>0 = FitToPage<br>Report contents are scaled to fit entirely within the pane dimensions.<br>1 = FitToWidth<br>Report contents are scaled to fit within the width of the page.<br>2 = ActualSize<br>Report contents are displayed at their actual size.
<table>
<tr><th>Data Type</th><th>Default Value</th><th>Read-Write Mode</th><th>Runtime Property</th><th>Layout Scriptable</th></tr>
<tr><td>Enum</td><td>FitToPage</td><td>Read/Write</td><td>No</td><td>Yes</td></tr>
</table></td></tr>
</table>

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

<table>
<tr><td>Contrast Mode</td><td>Display a Power BI report in choice of several high-contrast color combinations based on an assigned integer value.<br>0 = None<br>1 = HighContrast1<br>2 = HighContrast2<br>3 = HighContrastBlack<br>4 = HighContrastWhite
<table>
<tr><th>Data Type</th><th>Default Value</th><th>Read-Write Mode</th><th>Runtime Property</th><th>Layout Scriptable</th></tr>
<tr><td>Enum</td><td>None</td><td>Read/Write</td><td>No</td><td>Yes</td></tr>
</table></td></tr>
<tr><td colspan="2">Browser Property</td></tr>
<tr><td>StyleSheet</td><td>Cascading Style Sheet (CSS) whose properties override the appearance attributes set by the CSS of a web site. StyleSheet takes the entire CSS as string input.
<table>
<tr><th>Data Type</th><th>Default Value</th><th>Read-Write Mode</th><th>Runtime Property</th><th>Layout Scriptable</th></tr>
<tr><td>String</td><td>Empty</td><td>Read/Write</td><td>Yes</td><td>Yes</td></tr>
</table></td></tr>
</table>

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Power BI App Scripting

The Power BI app enables scripting capabilities at the Power BI report and page level. The Power BI app supports scripts that incorporate methods and their parameters as well as Power BI app properties. Script statements can be specified using the MyContent Namespace format in layout scripting by the following syntax formats:

MyContent.*name of the PowerBI App instance*.*PowerBIApp_Method*(parameter_1, parameter_2, parameter_n);

or

MyContent.*name of the PowerBI App instance*.*PowerBIApp_Property* = xxx

## Power BI App Properties in Layout Scripts

The following table lists Power BI app properties as they appear in the **Properties** page of Layout and ViewApp editors and how they are specified in layout scripting. Notice that property names in layout scripting are single words without blank spaces.

| Power BI App Properties | Layout Script Editor | Layout Scriptable (Yes/No) |
|---|---|---|
| Workspace ID | WorkspaceID | Yes |
| Report ID | ReportID | Yes |
| Show Filter Pane | ShowFilterPane | Yes |
| Page Navigation | PageNavigation | Yes |
| Active Page | ActivePage | Yes |
| Authentication | Authentication | Yes |
| StyleSheet | StyleSheet | Yes |
| Transparent Background | TransparentBackground | No |
| Display Option | DisplayOption | yes |
| Contrast Mode | ContrastMode | Yes |

When embedding a Power BI report in the Power BI app, you can specify scripts whose methods apply filters during the loading phase. You can also change filters dynamically after a Power BI report is loaded. For example, you can create your own custom filter to match the brand of your application display asset specific data, and automatically apply filters to reports. You can also create button graphics that users select during runtime to apply filters to an embedded report in the Power BI app.

## Power BI App Script Methods

There are four types of script methods that filter data at the report or page level. Multiple filters of any type can be applied to a Power BI report

- A basic filter has a single operator with one or more values.
- An filter has a single logical operator and one or two conditions that have their own operator and value.

  **Note**: Do not specify more than two conditions when building an advanced filter. More than two conditions may cause undefined behavior.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- Relative date Filter
- Relative time Filter

The following list shows script operations around report filtering.

- Set filters
- Clear filters
- Update filters

## Power BI Basic Filter Scripts

Basic filter methods can set a data filter with a single operator on a Power BI report or a page.

### SetBasicReportFilter()

A basic filter has a single operator with one or more values. A basic filter script can be specified in layout scripts.

```
SetBasicReportFilter(string tableName, string columnName, string filterOperator, string values, string displayName, bool isHiddenInViewMode, bool isLockedInViewMode, bool requireSingleSelection, bool update = false)
```

#### *SetBasicReportFilter() Parameters*

- **tableName**

  Name of the Power BI report table containing the data to be filtered in the report.

- **columnName**

  Name of the column within the Power BI report table containing the data to be filtered in the report.

- **filterOperator**

  A basic filter script operator can be one of the following: "In" | "NotIn" | "All"

- **values**

  An array of values for the filter. All values must be of the same data type. Multiple values must be separated by a pipe '|' symbol.

- **displayName**

  A filter can be displayed in the filter pane with a personalized name. When the value is undefined or null, the default name of the filter will be displayed (typically the name of the filtered data field).

- **isHiddenInViewMode**

  Boolean value that determines if a hidden filter is applied to the report but not displayed in the filter pane in view mode. Set to true to hide the filter.

- **isLockedInViewMode**

  Boolean value that determines if a filter lock is applied and displayed in the filter pane. The filter value cannot be changed in view mode. Set to true to lock the filter.

- **requireSingleSelection**

  Boolean value that determines whether multiple values can be assigned to a filter or not.If set to true, only a single value can be selected. This parameter is available only for Basic filters.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- **update**

  Boolean value that determine whether multiple filters can be set. When update is true, a new filter will be added to the existing filters. If set to false, the existing filters are replaced.

  **Example**

  The following script statements remove existing filters and update the script with two new filters.

  ```
  SetBasicReportFilter("Time","FiscalMonth","In", "Oct|Dec", false);
  ```

  ```
  SetBasicReportFilter("Store","City","In", "Cary, NC", true);
  ```

**Example**

```
MyContent.PBIViewerCntrl.SetBasicReportFilter("Time","FiscalMonth","In", "Feb",
"MBF1",false, true,true);
```

This statement filters data from the FiscalMonth column of Time table to show data for the month of February. A personalized name of MBF1 has been assigned to the filter and a lock has been applied to it.

## SetBasicPageFilter()

A basic filter can also be applied to a Power BI report page. The report page name is passed in as the first parameter of the method.

```
SetBasicPageFilter(string pageName, string tableName, string columnName, string
filterOperator, string values, string displayName, bool isHiddenInViewMode, bool
isLockedInViewMode, bool requireSingleSelection, bool update = false)
```

### *SetBasicPageFilter() Parameters*

The SetBasicPageFilter() method includes the same parameters as the SetBasicReportFilter() method and the additional pageName parameter.

- **pageName**

  Name of the Power BI report page that displays the data to be filtered in the report.

- **tableName**

  Name of the Power BI report table containing the data to be filtered in the report.

- **columnName**

  Name of the column within the Power BI report table containing the data to be filtered in the report.

- **filterOperator**

  A basic filter script operator can be one of the following: "In" | "NotIn" | "All"

- **values**

  An array of values for the filter. All values must be of the same data type. Multiple values must be separated by a pipe '|' symbol.

- **displayName**

  A filter can be displayed in the filter pane with a personalized name. When the value is undefined or null, the default name of the filter will be displayed (typically the name of the filtered data field).

- **isHiddenInViewMode**

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

Boolean value that determines if a hidden filter is applied to the report but not displayed in the filter pane in view mode. Set to true to hide the filter.

- **isLockedInViewMode**

  Boolean value that determines if a filter lock is applied and displayed in the filter pane. The filter value cannot be changed in view mode. Set to true to lock the filter.

- **requireSingleSelection**

  Boolean value that determines whether multiple values can be assigned to a filter or not.If set to true, only a single value can be selected. This parameter is available only for Basic filters.

- **update**

  Boolean value that determine whether multiple filters can be set. When update is true, a new filter will be added to the existing filters. If set to false, the existing filters are replaced.

**Example**

```
MyContent.PBIViewerCntrl.SetBasicPageFilter("Page3","Time","FiscalMonth","In", "Oct|
Dec","MyFilter1",true,false,false);
```

This statement filters data for the months of October through December that appears on Page3 of the Power BI report. A personalized name of MyFilter1 has been assigned to the filter and it is hidden and does not appear on the Filters page.

## Power BI Advanced Filter Scripts

An advanced filter API sets an advanced filter on a Power BI report or a page.

### SetAdvancedReportFilter()

An advanced filter contains a single logical operator and one or two conditions that have their own operator and value. An advanced filter script can be specified in layout scripts.

```
SetAdvancedReportFilter(string tableName, string columnName, string logicalOperator, string
operator1, string value1, string operator2, string value2, string displayName, bool
isHiddenInViewMode, bool isLockedInViewMode, bool update = false)
```

#### *SetAdvancedReportFilter() Parameters*

- **tableName**

  Name of the Power BI report table containing the data to be filtered in the report.

- **columnName**

  Name of the column within the Power BI report table containing the data to be filtered in the report.

- **logicalOperator**

  The logical operator can be one of the following Boolean operators:

  "And" | "Or";

- **conditions**

  An array of conditions for the advanced filter. Each condition has an operator and a value specified in the form string operator1, string value1, string operator2, string value2.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

```
"None" | "LessThan" | "LessThanOrEqual" | "GreaterThan" | "GreaterThanOrEqual" |
"Contains" | "DoesNotContain" | "StartsWith" | "DoesNotStartWith" | "Is" | "IsNot" |
"IsBlank" | "IsNotBlank"
```

- **displayName**

  A filter can be displayed in the filter pane with a personalized name. When the value is undefined or null, the default name of the filter will be displayed (typically the name of the filtered data field).

- **isHiddenInViewMode**

  Boolean value that determines if a hidden filter is applied to the report but not displayed in the filter pane in view mode. Set to true to hide the filter.

- **isLockedInViewMode**

  Boolean value that determines if a filter lock is applied and displayed in the filter pane. The filter value cannot be changed in view mode. Set to true to lock the filter.

- **update**

  Boolean value that determine whether multiple filters can be set. When update is true, a new filter will be added to the existing filters. If set to false, the existing filters are replaced.

**Example**

```
MyContent.PBIViewerCntrl.SetAdvancedReportFilter("Time","FiscalMonth","Or","Contains","Mar",
"Contains","Apr);
```

This statement filters data from the Time table for the months of March or April.

## SetAdvancedPageFilter()

An advanced page filter can also be applied to a report page. The page name of the Power BI report must be passed in as the first parameter.

```
SetAdvancedPageFilter(string pageName, string tableName, string columnName, string
logicalOperator, string operator1, string value1, string operator2, string value2, string
displayName, bool isHiddenInViewMode, bool isLockedInViewMode, bool update = false)
```

### *SetAdvancedPageFilter() Parameters*

The SetAdvancedPageFilter() method includes the same parameters as the SetAdvancedReportFilter() method and also includes the pageName parameter.

- **pageName**

  Name of the Power BI report page that displays the data to be filtered in the report.

- **tableName**

  Name of the Power BI report table containing the data to be filtered in the report.

- **columnName**

  Name of the column within the Power BI report table containing the data to be filtered in the report.

- **logicalOperator** - The logical operator can be one of the following Boolean operators:

  "And" | "Or";

- **conditions** - An array of conditions for the advanced filter. Each condition has an operator and a value.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

```
"None" | "LessThan" | "LessThanOrEqual" | "GreaterThan" | "GreaterThanOrEqual" |
"Contains" | "DoesNotContain" | "StartsWith" | "DoesNotStartWith" | "Is" | "IsNot" |
"IsBlank" | "IsNotBlank"
```

- **displayName**

  A filter can be displayed in the filter pane with a personalized name. When the value is undefined or null, the default name of the filter will be displayed (typically the name of the filtered data field).

- **isHiddenInViewMode**

  Boolean value that determines if a hidden filter is applied to the report but not displayed in the filter pane in view mode. Set to true to hide the filter.

- **isLockedInViewMode**

  Boolean value that determines if a filter lock is applied and displayed in the filter pane. The filter value cannot be changed in view mode. Set to true to lock the filter.

- **update**

  Boolean value that determine whether multiple filters can be set. When update is true, a new filter will be added to the existing filters. If set to false, the existing filters are replaced.

**Example**

```
MyContent.PBIViewerCntrl.SetAdvancedPageFilter("Time","FiscalMonth","Or","Contains","Mar","Contains","Apr);
```

This example shows data from the FiscalMonth table for the months of March or April.

## Power BI Relative Date Filter Scripts

Date filter methods are used to filter data collected over a specified date period. Relative date filters can be set at the Power BI report and page level.

### SetRelativeDateReportFilter()

A relative date report filter script can be specified in layout scripts.

```
SetRelativeDateReportFilter(string tableName, string columnName, string filterOperator,
string timeUnitsCount, string timeUnitsType, bool includeToday, string displayName, bool
isHiddenInViewMode, bool isLockedInViewMode, bool update = false)
```

#### *SetRelativeDateReportFilter() Parameters*

The following list shows the parameters required to set relative date report filters.

- **tableName**

  Name of the Power BI report table containing the data to be filtered in the report.

- **columnName**

  Name of the column within the Power BI report table containing the data to be filtered in the report.

- **filterOperator**

  The operator for relative date and time filters can be one of the following:

  - 0 = InLast

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- 1 = InThis
- 2 = InNext

  The single digit value of filterOperator specifies the type of date and time operator.

- **timeUnitsCount**

  The number of time units.

- **timeUnitsType**

  The unit of time the filter is using, as shown below:

  - 0 = Days
  - 1 = Weeks
  - 2 = CalendarWeeks
  - 3 = Months
  - 4 = CalendarMonths
  - 5 = Years
  - 6 = CalendarYears
  - 7 = Minutes
  - 8 = Hours

- **includeToday**

  Boolean value that specifies whether to include the current day in the filter or not. When set to true, the current day is included in the date filter.

- **displayName**

  A filter can be displayed in the filter pane with a personalized name. When the value is undefined or null, the default name of the filter will be displayed (typically the name of the filtered data field).

- **isHiddenInViewMode**

  Boolean value that determines if a hidden filter is applied to the report but not displayed in the filter pane in view mode. Set to true to hide the filter.

- **isLockedInViewMode**

  Boolean value that determines if a filter lock is applied and displayed in the filter pane. The filter value cannot be changed in view mode. Set to true to lock the filter.

- **update**

  Boolean value that determine whether multiple filters can be set. When update is true, a new filter will be added to the existing filters. If set to false, the existing filters are replaced.

**Example**

```
MyContent.PBIViewerCntrl.SetRelativeDateReportFilter("Sales","OrderDate", "0","2","5",true,
"MyFilter3",true, false);
```

This statement filters order information from the Sales table in the last two years and includes today's data.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

## SetRelativeDatePageFilter()

A basic relative date filter can also be applied to a Power BI report page. The page name must be passed in as the first parameter.

```
SetRelativeDatePageFilter(string pageName, string tableName, string columnName, string filterOperator, string timeUnitsCount, string timeUnitsType, bool includeToday, string displayName, bool isHiddenInViewMode, bool isLockedInViewMode, bool update = false)
```

### *SetRelativeDatePageFilter() Parameters*

The RelativeDatePageFilter method includes the same parameters as the SetRelativeDateFilter() method and also includes the pageName parameter.

- **pageName**

  Name of the Power BI report page that displays the data to be filtered in the report.

- **tableName**

  Name of the Power BI report table containing the data to be filtered in the report.

- **columnName**

  Name of the column within the Power BI report table containing the data to be filtered in the report.

- **filterOperator**

  The operator for relative date and time filters can be one of the following:

  - 0 = InLast
  - 1 = InThis
  - 2 = InNext

    The single digit value of filterOperator specifies the type of date and time operator.

- **timeUnitsCount**

  The number of time units.

- **timeUnitsType**

  The unit of time the filter is using, as shown below:

  - 0 = Days
  - 1 = Weeks
  - 2 = CalendarWeeks
  - 3 = Months
  - 4 = CalendarMonths
  - 5 = Years
  - 6 = CalendarYears
  - 7 = Minutes
  - 8 = Hours

- **includeToday**

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

Boolean value that specifies whether to include the current day in the filter or not. When set to true, the current day is included in the date filter.

- **displayName**

  A filter can be displayed in the filter pane with a personalized name. When the value is undefined or null, the default name of the filter will be displayed (typically the name of the filtered data field).

- **isHiddenInViewMode**

  Boolean value that determines if a hidden filter is applied to the report but not displayed in the filter pane in view mode. Set to true to hide the filter.

- **isLockedInViewMode**

  Boolean value that determines if a filter lock is applied and displayed in the filter pane. The filter value cannot be changed in view mode. Set to true to lock the filter.

- **update**

  Boolean value that determine whether multiple filters can be set. When update is true, a new filter will be added to the existing filters. If set to false, the existing filters are replaced.

**Example**

```
MyContent.PBIViewerCntrl.SetRelativeDatePageFilter("ReportSec3","Sales","OrderDate",
"0","2","5",false, "MyFilter4",true, false, true);
```

This statement filters order information from the Sales table over the last two years and does not include today's data. The filtered data appears on the ReportSec3 page of the Power BI report. The filter has been assigned the name MyFilter4 and is hidden on the Power BI report Filter area. The filter is unlocked and a new filter can be added because the update parameter is true.

## Power BI Relative Time Filter Scripts

Relative time filter methods can be used in layout scripting to select data to appear in a report based upon a specified time period. Relative time filters can be set at the Power BI report and page level.

### SetRelativeTimeReportFilter()

```
SetRelativeTimeReportFilter(string tableName, string columnName, string filterOperator,
string timeUnitsCount, string timeUnitsType, string displayName, bool isHiddenInViewMode,
bool isLockedInViewMode, bool update = false
```

#### *SetRelativeTimeReportFilter() Parameters*

Relative time filters are similar to relative date filters and use similar parameters.

- **tableName**

  Name of the Power BI report table containing the data to be filtered in the report.

- **columnName**

  Name of the column within the Power BI report table containing the data to be filtered in the report.

- **filterOperator**

  The operator for relative date and time filters can be one of the following:

  - 0 = InLast

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- 1 = InThis
- 2 = InNext

  The single digit value of filterOperator specifies the type of date and time operator.

- **timeUnitsCount**

  The number of time units.

- **timeUnitsType**

  The unit of time the filter is using, as shown below:

  - 0 = Days
  - 1 = Weeks
  - 2 = CalendarWeeks
  - 3 = Months
  - 4 = CalendarMonths
  - 5 = Years
  - 6 = CalendarYears
  - 7 = Minutes
  - 8 = Hours

- **displayName**

  A filter can be displayed in the filter pane with a personalized name. When the value is undefined or null, the default name of the filter will be displayed (typically the name of the filtered data field).

- **isHiddenInViewMode**

  Boolean value that determines if a hidden filter is applied to the report but not displayed in the filter pane in view mode. Set to true to hide the filter.

- **isLockedInViewMode**

  Boolean value that determines if a filter lock is applied and displayed in the filter pane. The filter value cannot be changed in view mode. Set to true to lock the filter.

- **update**

  Boolean value that determine whether multiple filters can be set. When update is true, a new filter will be added to the existing filters. If set to false, the existing filters are replaced.

**Example**

```
MyContent.PBIViewerCntrl.SetRelativeTimeReportFilter("Sales","OrderDate",
"0","12","8" ,"MyFilter5", true, false);
```

This filter statement selects order data from the Sales table that has been collected in the last 12 hours. The filter has been assigned the name MyFilter5 and is hidden on the Power BI report Filter page.

## SetRelativeTimePageFilter()

The basic relative time filter can also be applied to a Power BI report page. The page name must be passed in as the first parameter.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

```
SetRelativeTimePageFilter(string pageName, string tableName, string columnName, string
filterOperator, string timeUnitsCount, string timeUnitsType, string displayName, bool
isHiddenInViewMode, bool isLockedInViewMode, bool update = false)
```

### *SetRelativeTimePageFilter() Paramers*

The RelativeTimePageFilter method includes the same parameters as the SetRelativeTimeFilter() method and also includes the pageName parameter.

- **pageName**

  Name of the Power BI report page that displays the data to be filtered in the report.

- **tableName**

  Name of the Power BI report table containing the data to be filtered in the report.

- **columnName**

  Name of the column within the Power BI report table containing the data to be filtered in the report.

- **filterOperator**

  The operator for relative date and time filters can be one of the following:

  - 0 = InLast
  - 1 = InThis
  - 2 = InNext

    The single digit value of filterOperator specifies the type of date and time operator.

- **timeUnitsCount**

  The number of time units.

- **timeUnitsType**

  The unit of time the filter is using, as shown below:

  - 0 = Days
  - 1 = Weeks
  - 2 = CalendarWeeks
  - 3 = Months
  - 4 = CalendarMonths
  - 5 = Years
  - 6 = CalendarYears
  - 7 = Minutes
  - 8 = Hours

- **displayName**

  A filter can be displayed in the filter pane with a personalized name. When the value is undefined or null, the default name of the filter will be displayed (typically the name of the filtered data field).

- **isHiddenInViewMode**

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

Boolean value that determines if a hidden filter is applied to the report but not displayed in the filter pane in view mode. Set to true to hide the filter.

- **isLockedInViewMode**

  Boolean value that determines if a filter lock is applied and displayed in the filter pane. The filter value cannot be changed in view mode. Set to true to lock the filter.

- **update**

  Boolean value that determine whether multiple filters can be set. When update is true, a new filter will be added to the existing filters. If set to false, the existing filters are replaced.**Example**

**Example**

```
MyContent.PBIViewerCntrl.SetRelativeTimePageFilter("ReportSection1","Sales","OrderDate",
"0","12","8" ,"MyFilter6", true, false, false);
```

This filter statement selects data from the Sales table that has been collected in the last 12 hours and is displayed on the ReportSection1 report page. The filter has been assigned the name MyFilter6 and is hidden on the Power BI report Filter page.

## Report Filtering Scripting Operations

The Power BI app includes methods to clear or modify filtering at the report and page levels by layout scripts.

### ClearReportFilters

This ClearReportFilters method removes all filters at the Power BI report level.

```
Mycontent.PBIViewerCntrl.ClearReportFilters();
```

### ClearPageFilters

The ClearPageFilters method removes all filters at the specified page in the Power BI report.

```
MyContent.PBIViewerCntrl.ClearPageFilters("ReportPage1");
```

### FullScreen

The FullScreen method shows the Power BI report in full screen mode. While a ViewApp is running, the Power BI app must have focus when calling the FullScreen method. Press the Esc key or invoke the ExitFullScreen () method to exit from full screen mode.

FullScreen() requires an accompanying user gesture to expand the screen and cannot be called only by script, FullScreen() in a script needs to be initiated by a user gesture such as a mouse click or a pressed key event.

```
MyContent.PBIViewerCntrl.FullScreen();
```

### ExitFullScreen

The ExitFullScreen method returns a Power BI report shown in fullscreen mode to the normal Power BI report size shown in a ViewApp pane.

```
MyContent.PBIViewerCntrl.ExitFullScreen();
```

### Refresh

This method refreshes the underlined data of an embedded report without resetting the current filters or user interactions.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

```
MyContent.PBIViewerCntrl.Refresh();
```

### Render

This method re-renders the embedded report without reloading the web page. It resets the current filters and user interactions to return the embedded Power BI report back to its original state

```
MyContent.PBIViewerCntrl.Render();
```

### Reload

This method reloads the embedded report and resets the current filters and user interactions. The Power BI report returns to its original state. For example, in a report this effectively clears all the new filters originally saved and makes the page the report was saved on as active, resetting a report back to its original state.

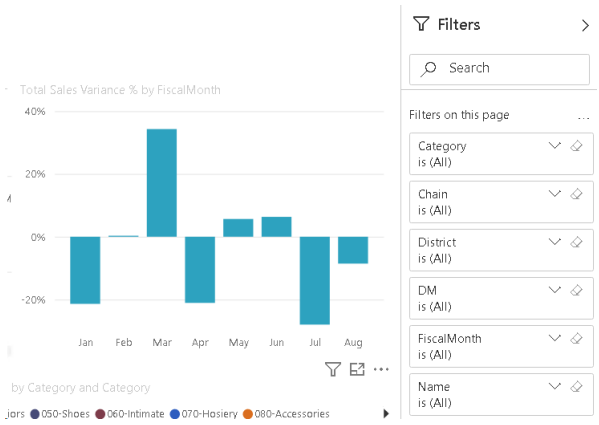
```
MyContent.PBIViewerCntrl.Reload();
```

## Power BI App Script Example

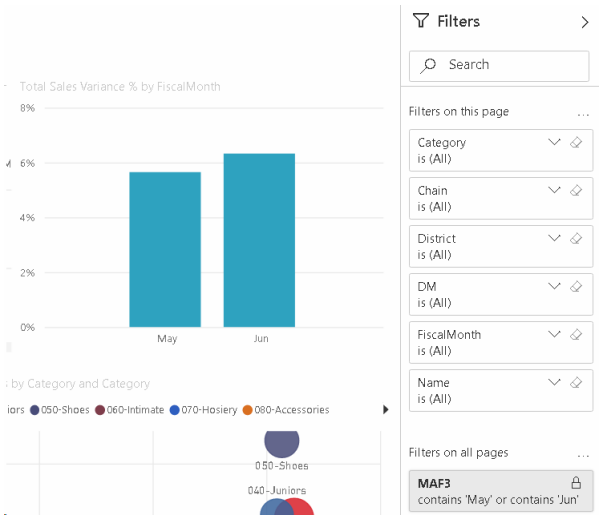
This example demonstrates a simple method to incorporate scripting with the Power BI app using UDO objects that appear in the the ViewApp's Navigation Tree that point to specific statements in a layout script of the pane in which the Power BI has been placed.

In the example shown below, a Power BI app script has run to restrict the displayed monthly sales variance data to the months of May and June.

**Before Power BI Script Filtering**




**After Power BI Script Filtering**




The remainder of this example shows the essential steps to incorporate a Power BI app layout script into a ViewApp. In the example shown below, the ViewApp builder has created a set of UDO objects and assigned custom friendly names to them. During runtime, the objects appear in the ViewApp's Navigation Tree by their friendly names. The layout script should contain statements that compare the current focus of the ViewApp to the friendly names shown in the Navigation Tree.

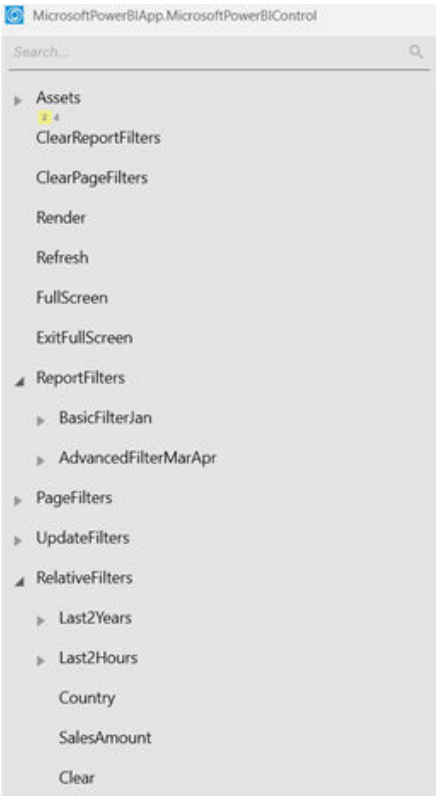
```
elseif(MyViewApp.Navigation.Current=="AdvancedFilterMarApr")
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

**UDO Objects for a ViewApp**




**Navigation Tree Containing Objects as Nodes**




During runtime, the user selects a node from the Navigation Tree to set the focus of the ViewApp. In this example, the user selects a node from the Navigation Tree named AdvancedFilterWithLockedMayJun. A statement in a layout script compares the current navigation node to AdvancedFilterWithLockedMayJun. On a match, the following script statement executes to filter monthly fiscal data to show only the months of May or June.

```
elseif (MyViewApp.Navigation.Current=="AdvancedFilterWithLockedMayJun")

then
MyContent.PowerBIViewerControl1.SetAdvancedReportFilter("Time","FiscalMonth","Or","Contains
","May","Contains", "Jun","MAF3",false, true);
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Join the Microsoft 365 Developer Program

The Microsoft 365 Developer Program offers a testing sandbox, software tools, and other resources to build solutions for the Microsoft 365 platform. By joining the Microsoft 365 Developer Program you will be able to create some test Power BI reports that can be used to evaluate the Power BI app.

---

**Important**: This procedure is intended for users who want to evaluate the Power BI app and how it works with Power BI reports. This procedure shows a set of steps to join the MIcrosoft 365 Developer Program. Readers should understand that Microsoft may change their requirements to join the Microsoft 365 Developer Program, which is beyond the capability of AVEVA to address in its documentation.

---

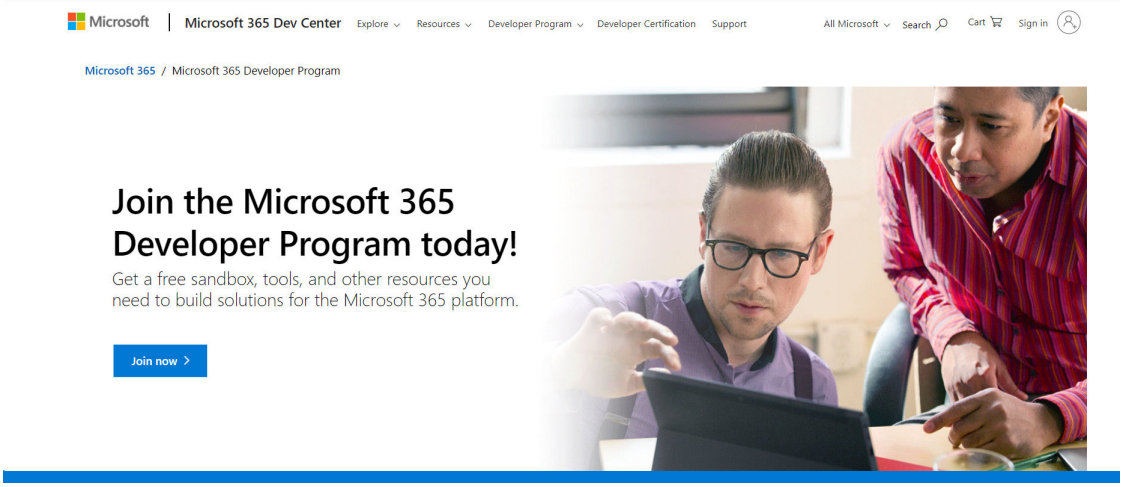
After you join and create your administrator account, see Create and Publish a Power BI Report for the steps to create a report.

### To join the Microsoft 365 Developer Program

1. With you web browser, show the Microsoft 365 Developer Program web site. At the time of writing, the URL was:

   https://developer.microsoft.com/en-us/microsoft-365/dev-program

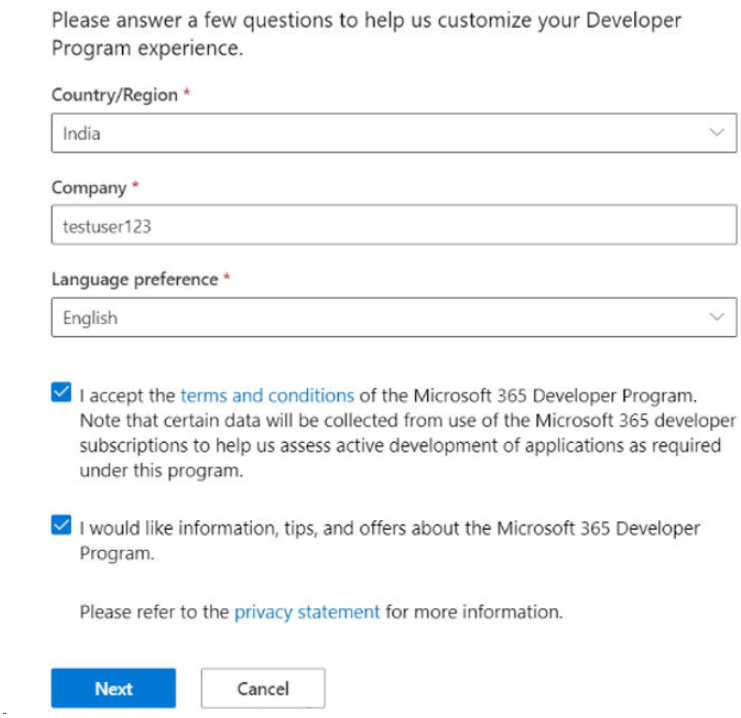
2. Click **Join Now** from the web page.



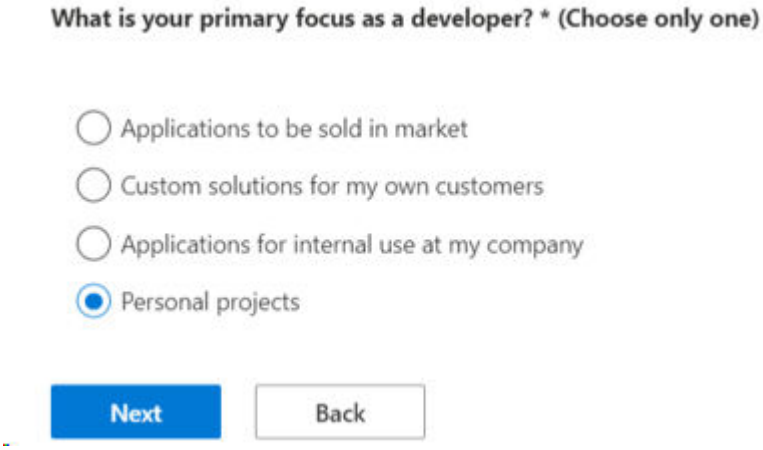

3. Follow the steps of the **Join the Microsoft 365 Developer Program** to create your account.

   You must enter your personal data as requested. The following screen shot shows example test data.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

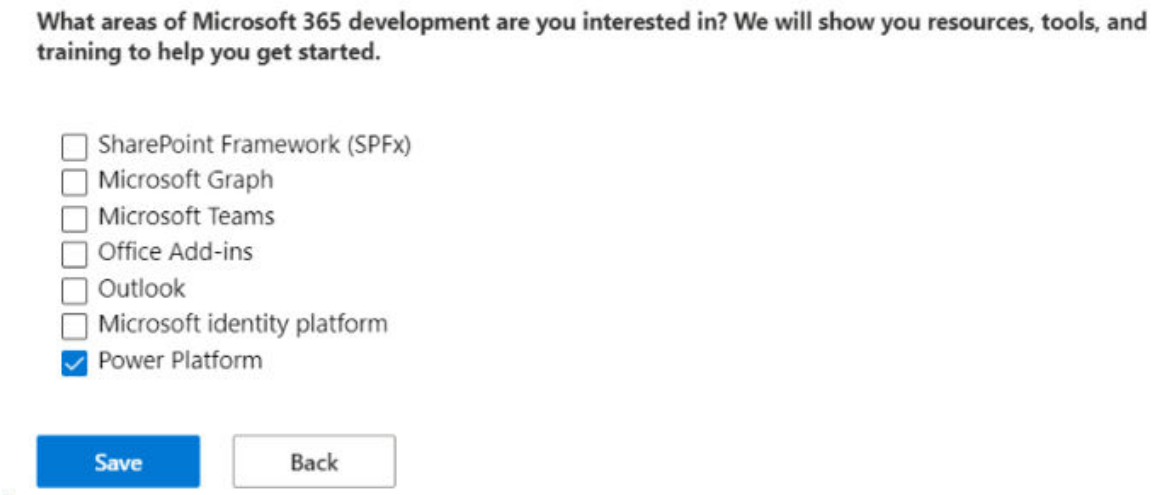



4. Click **Next** and choose **Personal project**s as your primary focus as a developer.

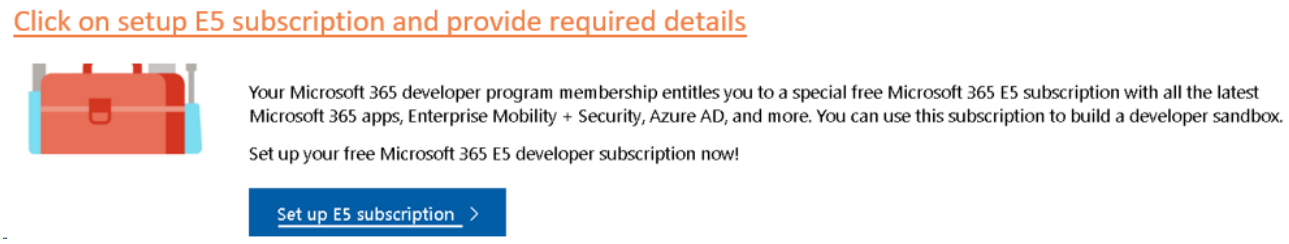



5. Click **Next** and select **Power Platform**.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

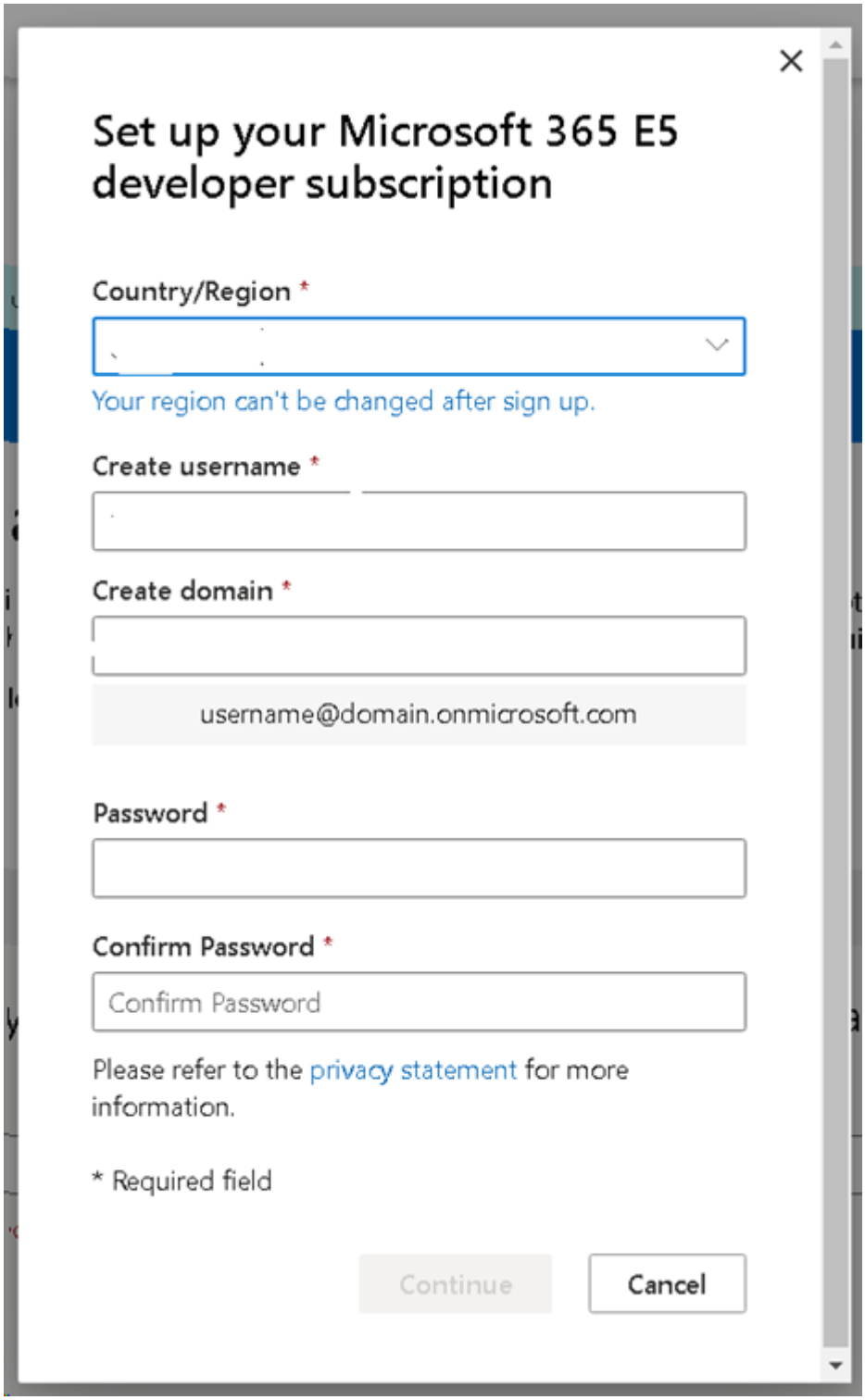



6. Click **Save** and select **Set up E5 subscription**.

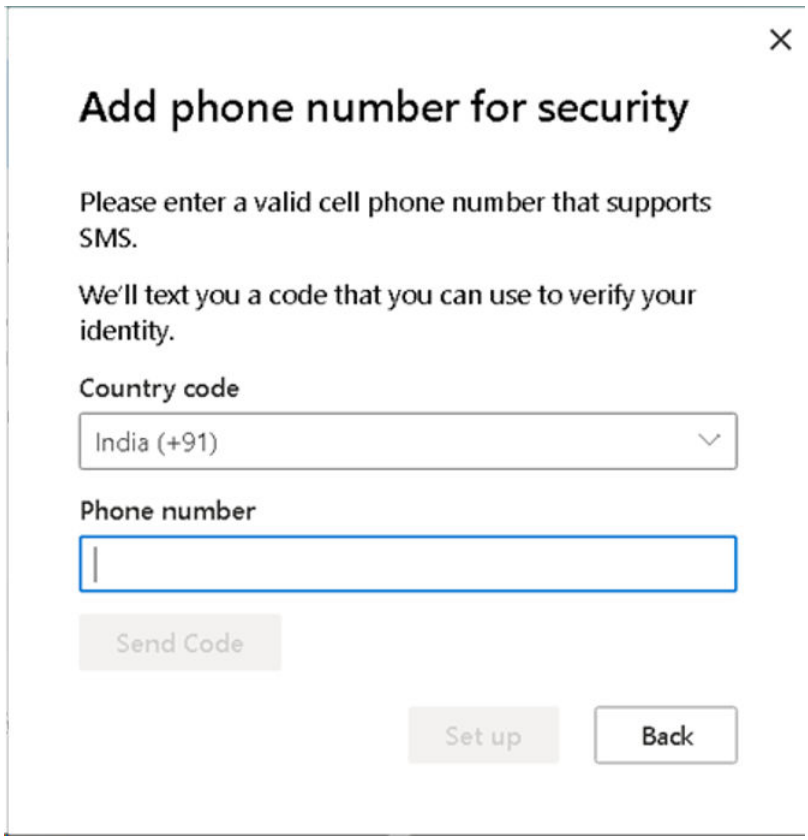



7. Set up your developer subscription.

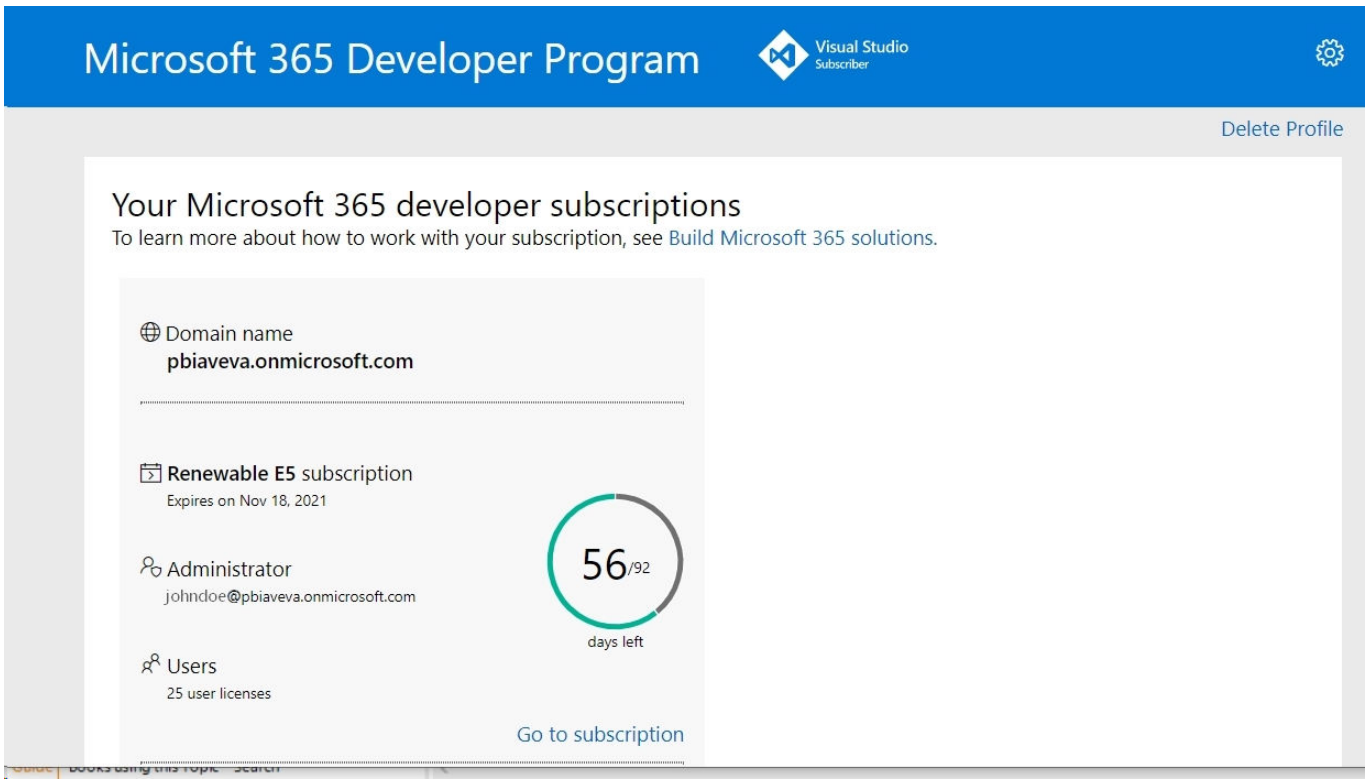
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.



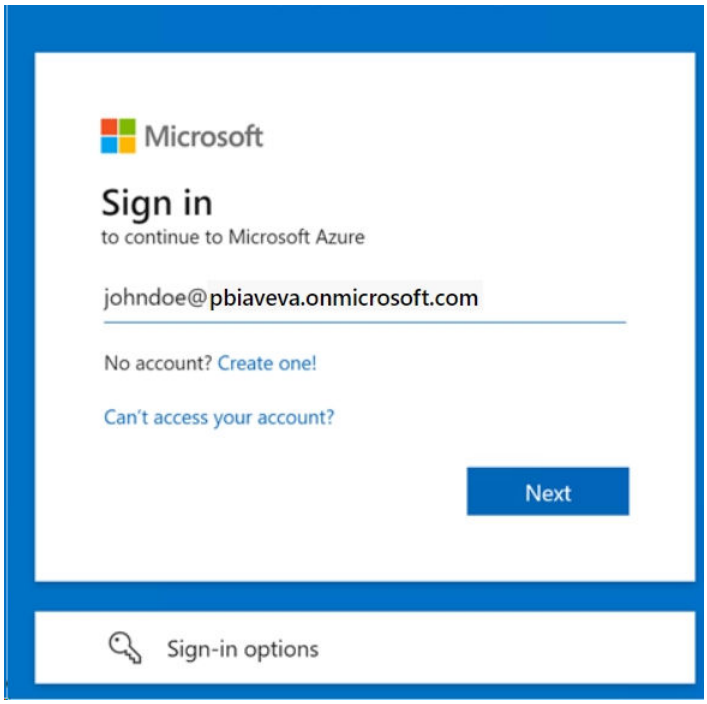

8. After you set up your developer subscription, sign into the Azure portal by clicking on **Go to subscription**.




© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

This will take you to https://portal.azure.com/.

9. Log in with your administrator credentials.




© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

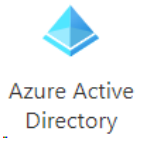
# Create and Publish a Power BI Report

The following procedure describes the steps a Power BI designer can follow to create and publish a Power BI report. The procedure is offered as a means to quickly get started publishing a Power BI report for use with the Power BI app. Refer to Microsoft Power BI documentation for more information about publishing Power BI reports.

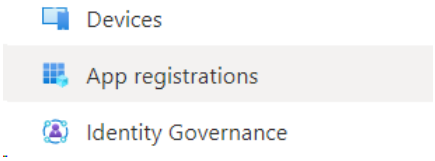
**Important**: A Power BI report for use with the Power BI app must be published using the option "embed for your customers application".

### To create and publish a Power BI report

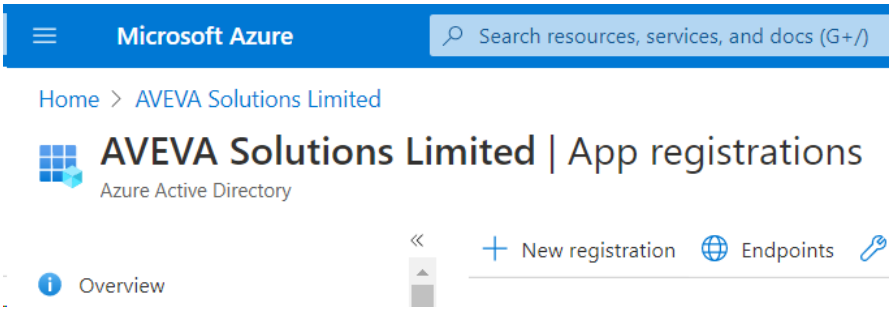
1. Open the Microsoft Azure website (https://portal.azure.com/) and log in with your Azure administrator credentials.
2. Go to **Azure Active Directory** from the Azure portal menu.




3. Go to **App registrations** from the portal menu.

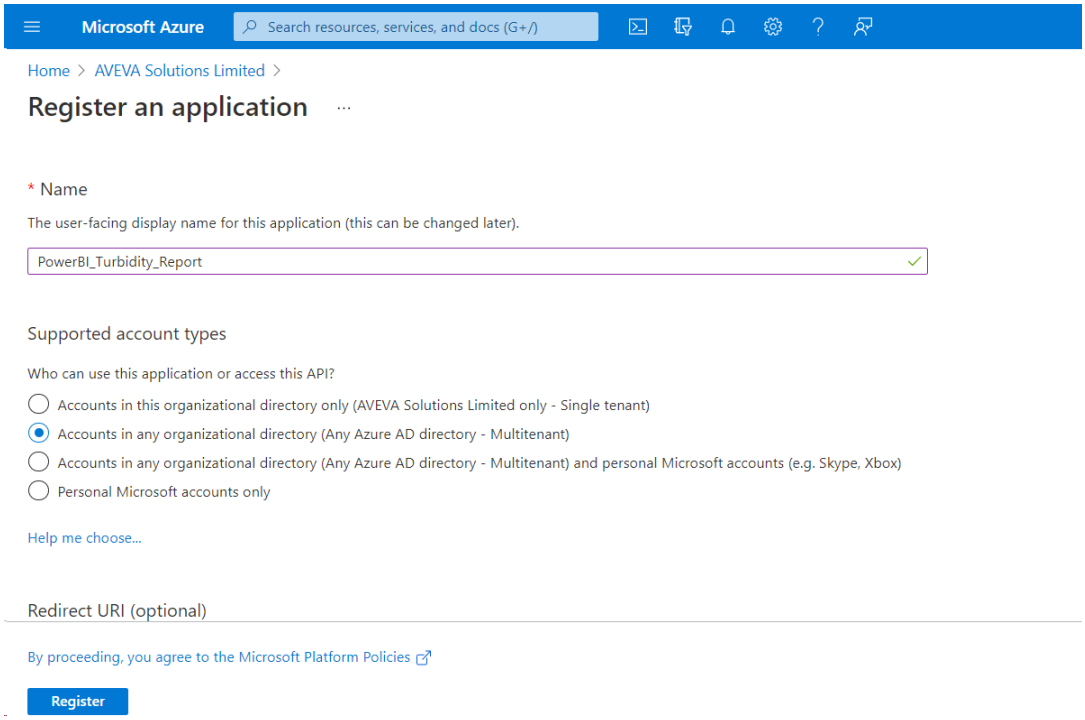



4. Click **New registration**.

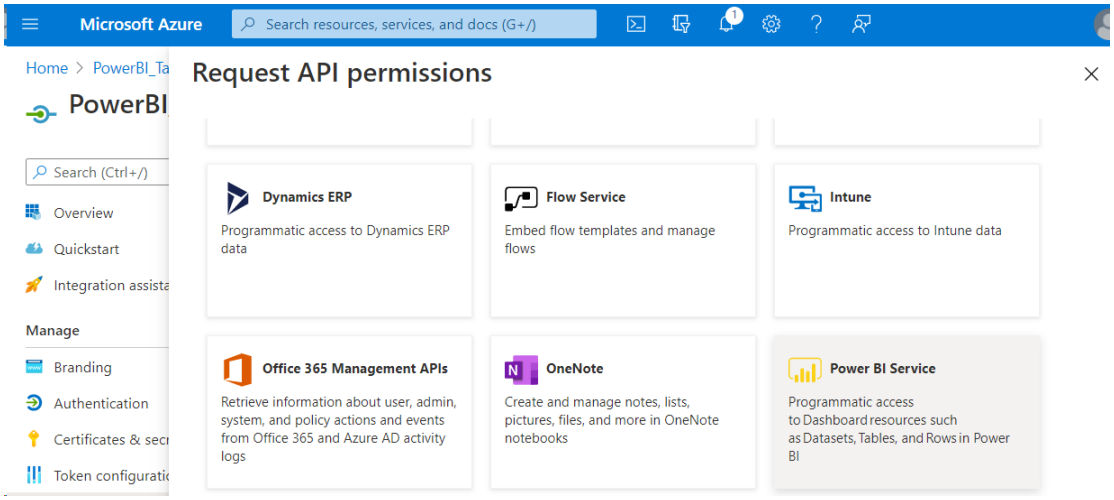



5. Assign a name for the application and select the Accounts in any organization directory option, as shown below and click **Register**.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

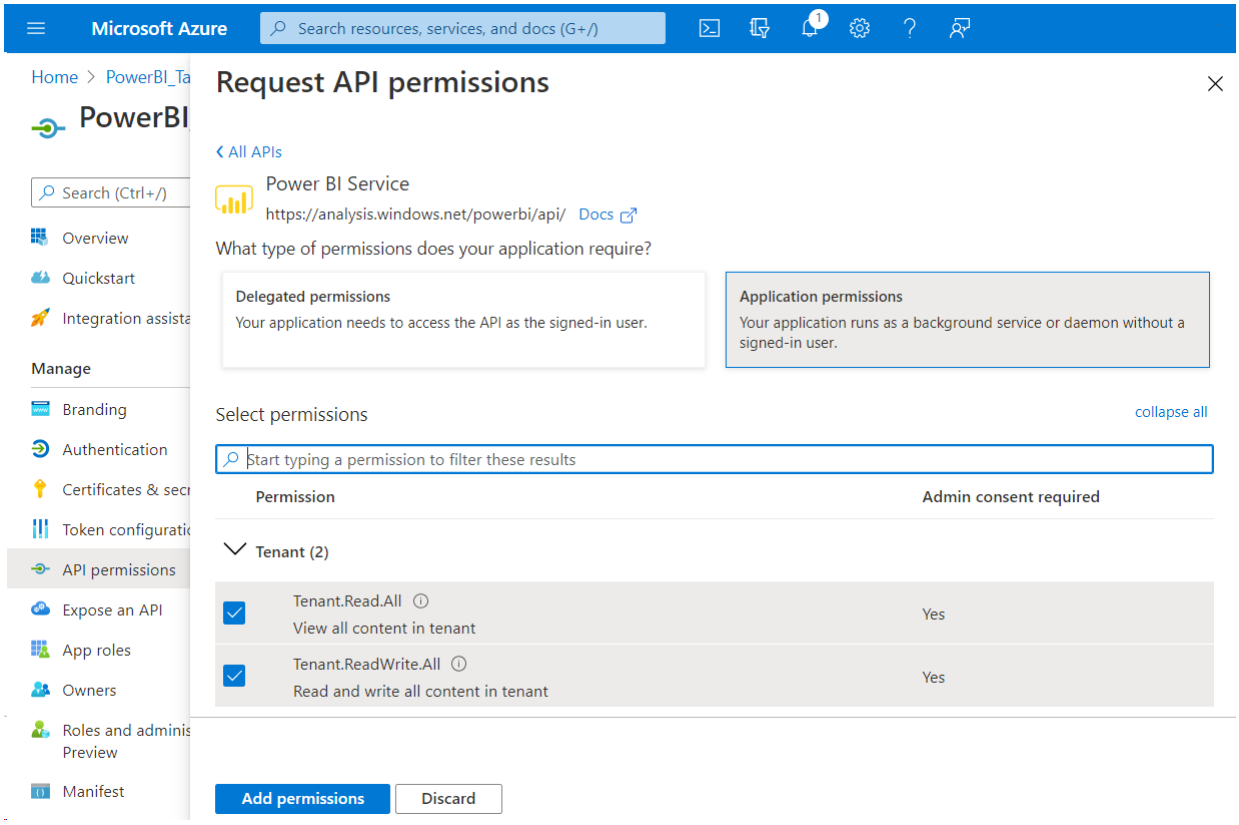



6. Select **API Permissions** from the portal menu and click **Add a permission**.
7. Scroll through the list of permissions until you see the **Power BI Service**, and then select it.



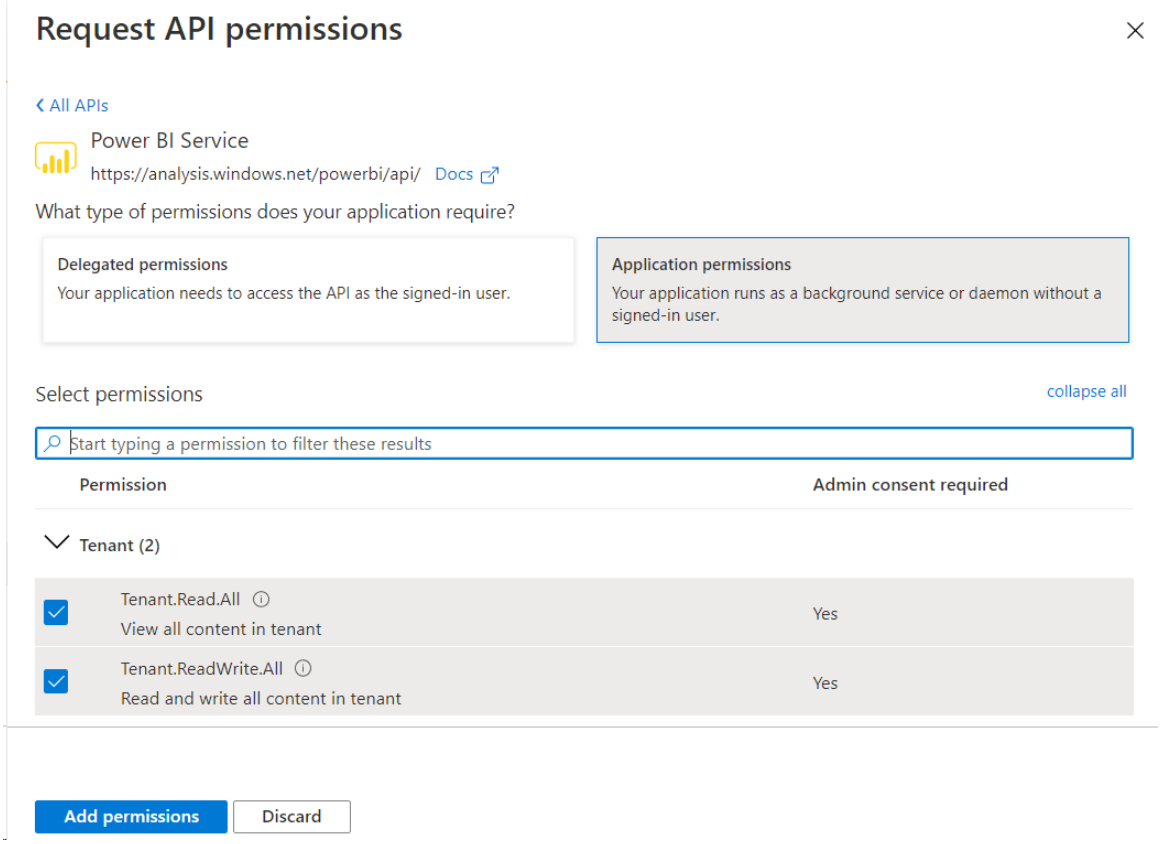

8. Select **Application Permissions** from the **Request API permissions** page.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

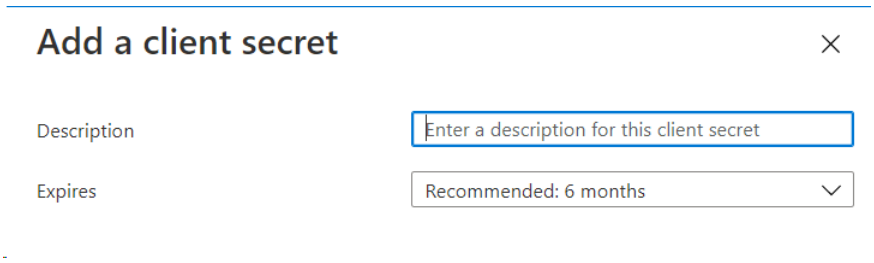



9. Under **Tenant**, select both Read/Write permissions.
10. Select **Add permissions**.
11. Grant Admin consent for the application.

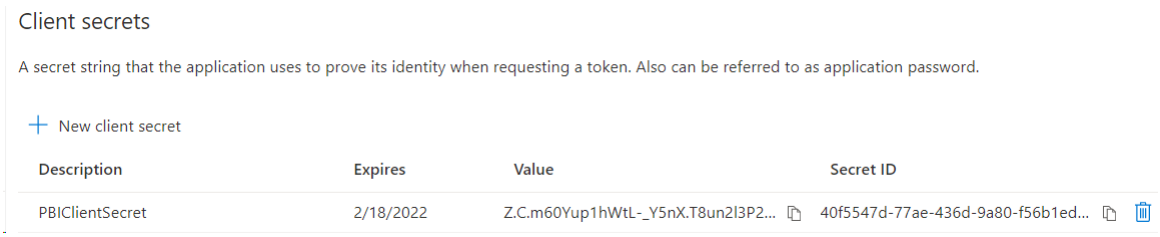
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




12. Select **Certificates & Secrets** from the portal menu.
13. Select **New client secret**.
14. Enter a description and expiration period on the **Add a client secret** page, and then select **Add**.



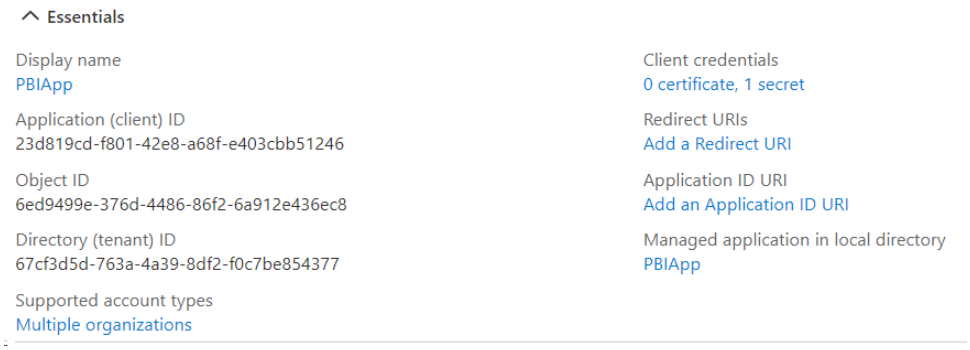

15. Enter a description and expiration period on the **Add a client secret** page, and then select **Add**.
16. Record the value of the client secret value, which is shown in the **Value** field below. You need the client secret value to create a named credential for the Power BI report discussed in the next section of this chapter.




© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

17. Select **Overview** from the portal menu.
18. Record the values assigned to the **Display name, Application (client) ID,** and **Directory (tenant) ID** fields.

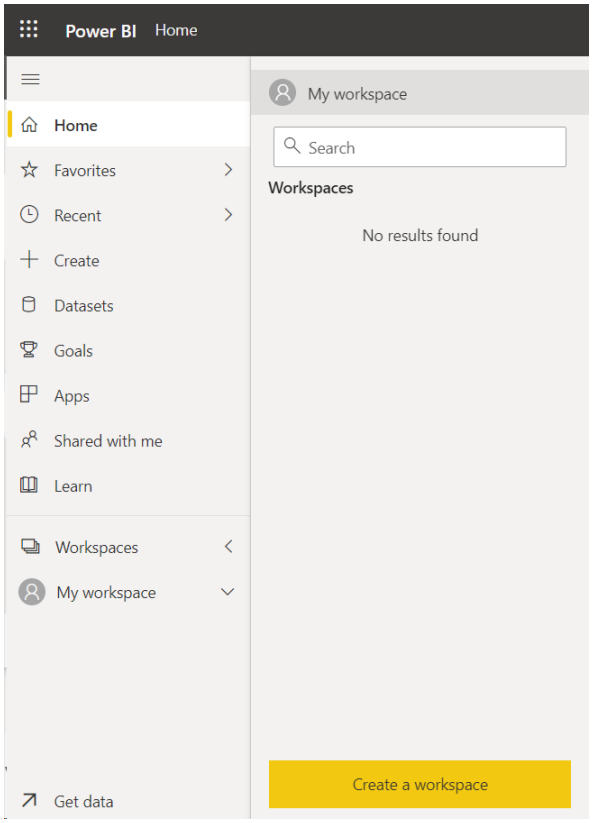
    These values are required to create a named credential for the Power BI report.




19. Open the Power BI web site with your same administrator credentials.

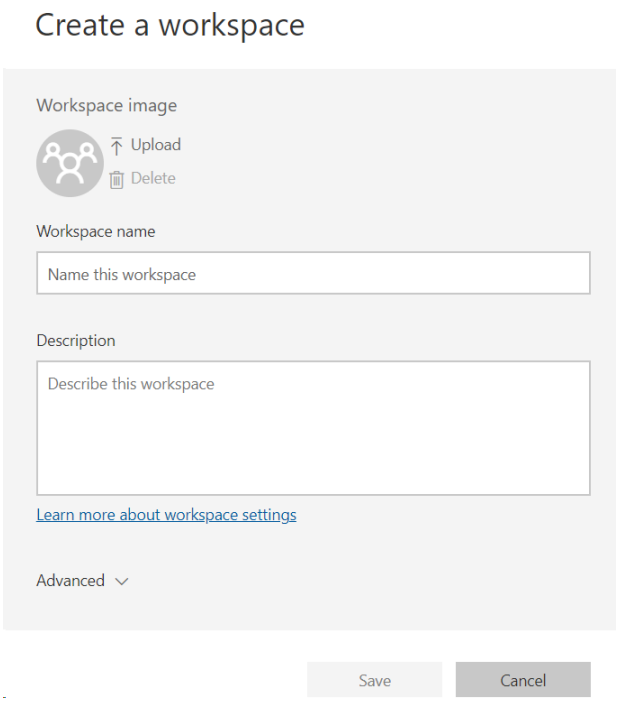
    https://app.powerbi.com/

20. Select **Workspaces** to show the **My workspace** page.

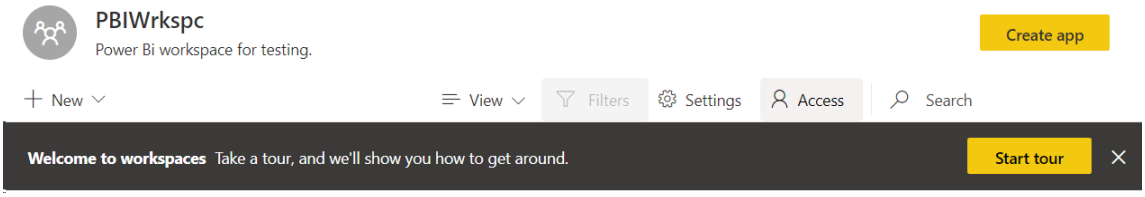



21. Select **Create a workspace**, which shows the **Create a workspace** page.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.



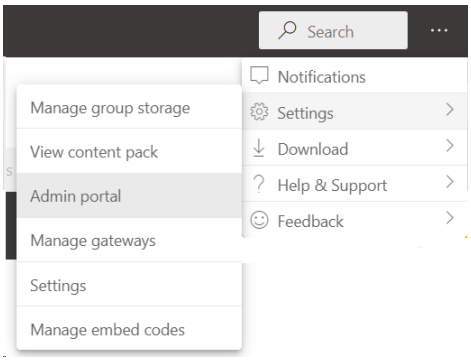

22. Enter a workspace name, a description, and then click **Save**.
23. Click **Access** from the **EquipmentStatusWorkspace** page.




24. Add the ServicePrincipal to this workspace.

    For an Azure AD app to be able to access the Power BI content and APIs, a Power BI admin needs to enable service principal access in the Power BI admin portal. If you're not the administrator of your tenant, get the tenant's administrator to enable the Tenant settings for you.

    a. In the Power BI service, select **Settings** > **Settings** >**Admin Portal**.



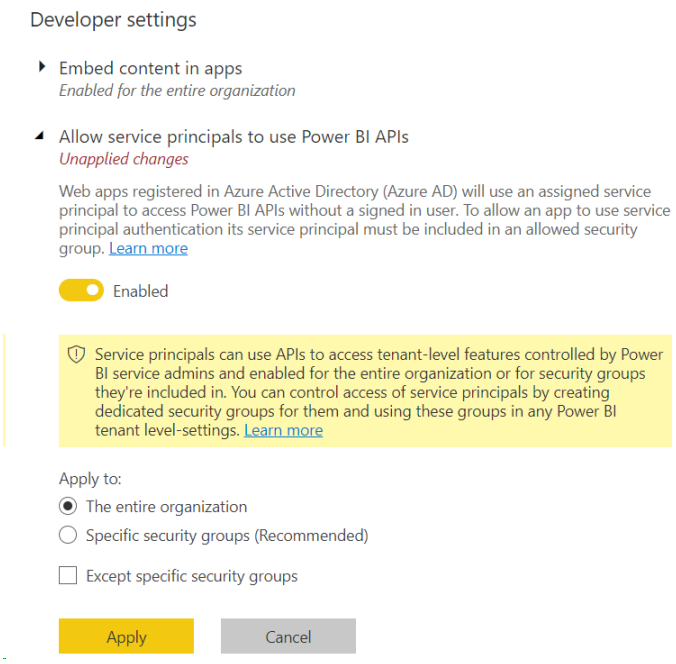

    b. In the **Admin Portal** area, select **Tenant Settings**.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

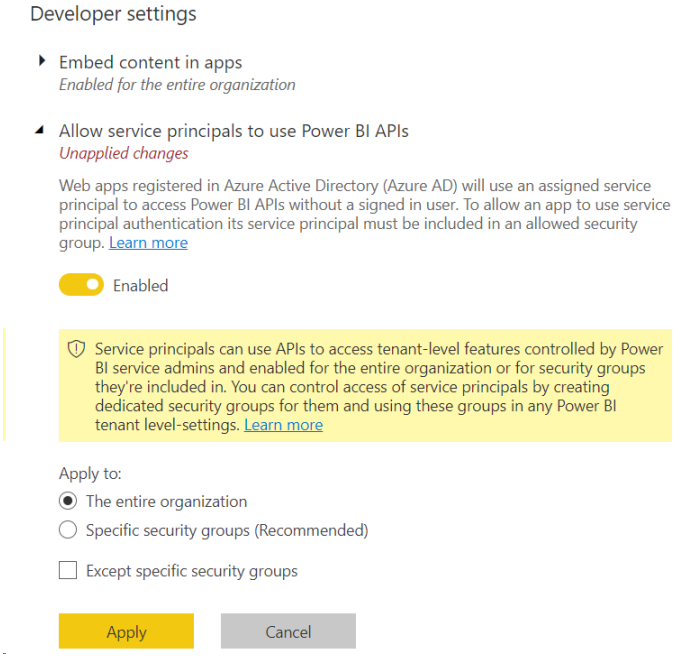
c. Select **Tenant settings** and then scroll down to the **Developer settings** section.

d. **Expand Allow service principals to use Power BI APIs**, and enable this option.

e. Select **The entire organization** option beneath **Apply to**.




25. Using your web browser's back key to return the **EquipmentStatusWorkspace** page that shows the **Access** tab.

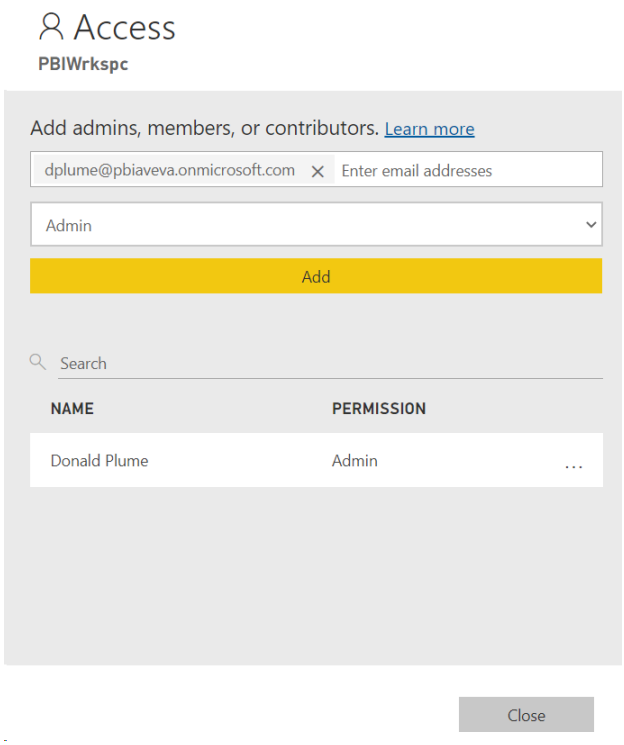



26. Select the **Access** tab to show the **Access** page.

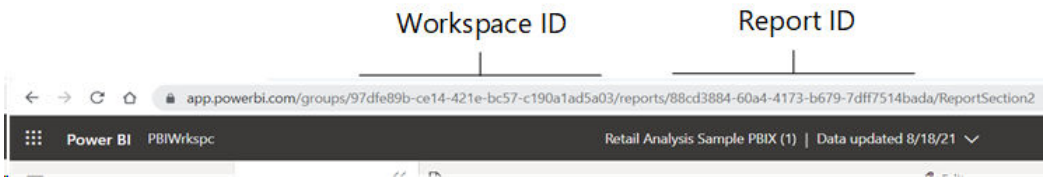
27. Enter the application name assigned in step 5 of this procedure and set the user role as an Admin.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

28. Click **Add** to make the report available.




29. Click **Close**.
30. Click **Add Content** and select the type of content you want to add to the report.
31. After the content is loaded in the report, select the Power BI report to show the Workspace ID and Report ID in the URL field of your web browser.




The Workspace and Report IDs should appear in the URL as 32 character values including hyphens.

Save the Workspace and Report IDs. You need this information to specify as values of Power BI app properties.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

## Power BI App Connectivity Behavior

The Power BI app uses Microsoft Power BI embedded analytics to show a report, which includes a refresh token. The refresh token is updated every 60 minutes in the background without reloading the Power BI report.

Power BI reports are not updated if the refresh token is not updated at the 60 minute interval.

- If a ViewApp is running with the Power BI app showing a report and the Internet connection is lost, the report attempts to reconnect. If connectivity is restored within an hour, the Power BI report automatically reconnects and shows the report.
- If the Internet connection is not restored before the call to refresh the token, a token generation error occurs. The error is logged and displays a visual cue to the user. When the Internet or network is restored, the Power BI report does not refresh automatically. The user must restart the ViewApp or at least reload the Power BI app to show a report.
- If a ViewApp containing a Power BI app is launched without Internet or network connectivity, the Power BI report attempts to connect for several seconds and then throws an error. The error is logged and shows an visual cue to the user. When connectivity is restored, the Power BI report does not automatically load. The ViewApp must be restarted or the Power BI app must be reloaded to show a report.
- If the Power BI app is unable to generate a new token because of network connectivity or other issues, an error is logged and a visual cue is shown to the user. After the token generation problem is solved,the user must restart the ViewApp or at least reload the Power BI app to show a report.

# NavigationApps

AVEVA OMI provides a pair of controls to enable users to set the focus within a ViewApp to show content from different navigation items of a navigation model.

- Configure the Breadcrumb Control

  The NavBreadcrumbControl shows a user-selected sequential path through ViewApp navigation model. Each segment shown in a breadcrumb display shows a selected navigation item.

- NavigationTree

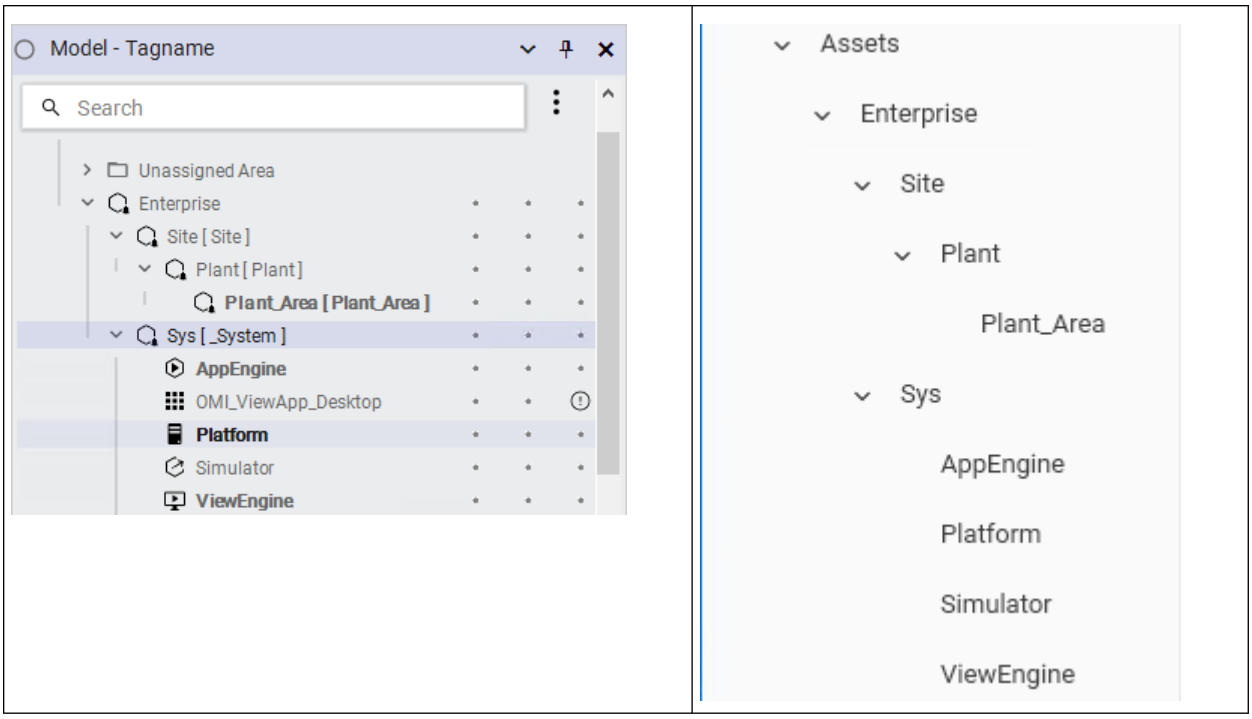
  The NavigationTree shows a familiar hierarchical arrangement of parent and child navigation items that together represent a ViewApp navigation model. Users select an item from the tree to show its content.

## NavigationTree

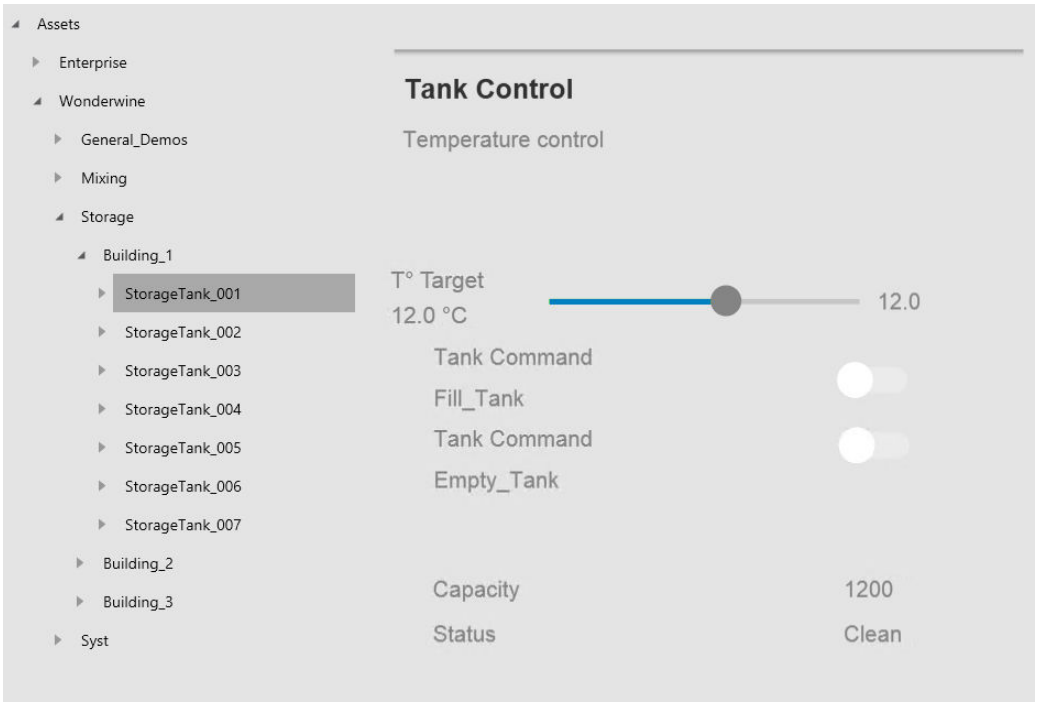
AVEVA OMI includes a NavTree app that shows a ViewApp's navigation items arranged in a hierarchical tree. During configuration time in the ViewApp Editor, the NavTree app shows this navigation item hierarchy based on the Model view of object instances shown in the **Template folder**. This view represents the navigation model of the ViewApp being edited.

| **Template Folder Model View** | **NavTree App in ViewApp Editor** |
|---|---|

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




During run time, users can select the chevron icon next to a navigation item to expand or collapse the tree of navigation items.When an item is selected from the tree, the item's navigation commands are executed and associated content appears in layout panes that meet the command requirements.




## Configure a NavigationTree Control

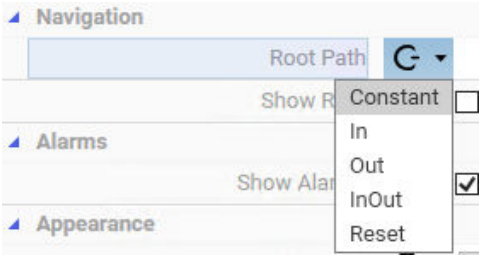
Aside from the standard **Content** and **Pane** properties of all objects and graphics, the NavTree app includes sets of **Behavior**, **Alarms**, **Appearance**, and **Search** properties:

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- Enable the **Show Root** property to show the root navigation item of the navigation model during run time.
- Enable the **Show. Alarms** property to show any active local and aggregated alarms on the individual items within the navigation model.
- Enable the **Show Search Bar** property to show a search field above the run-time Navigation tree to enter a search string. For more information about searching a ViewApp's navigation model during runtime, see Search View App Content During Runtime in the AVEVA OMI help.
- The **Appearance** properties determine the color, size, and font family of text shown on the navigation tree.

Each property contains a drop-down list of binding options. Some properties only provide a **Reset** option to reset a property value to its default.

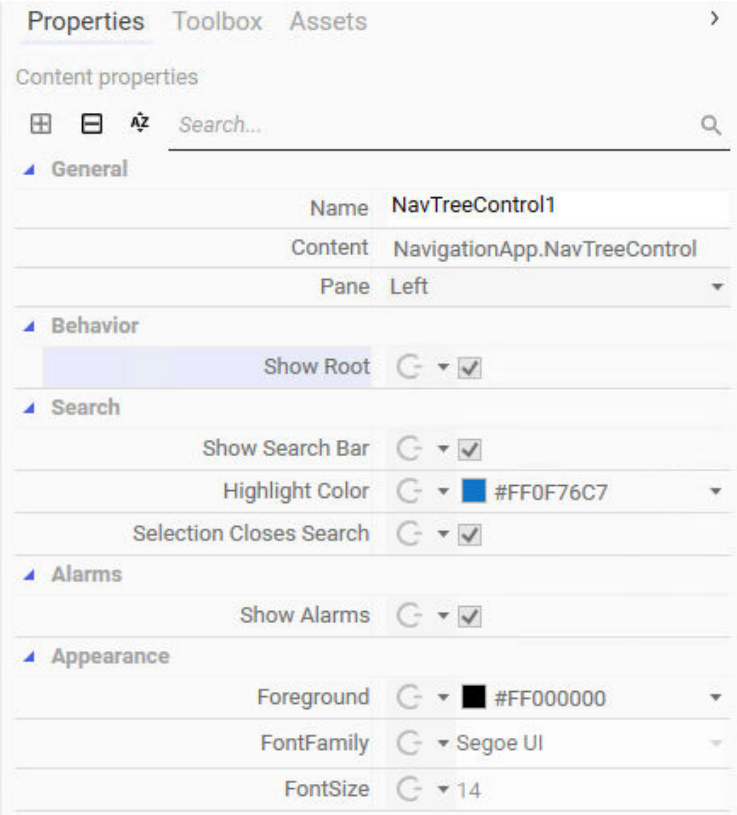
In addition to a static binding, dynamic binding values can also be configured.




The type of control property /attribute binding can be specified by selecting a value from the drop-down list.

| | |
|---|---|
| **Constant** | Static binding to the specified path. Enter a value in the data entry field. |
| **In** | Dynamic root path with read only binding by the control to a reference. |
| **Out** | Dynamic root path with write only binding by the control to a reference. |
| **InOut** | Dynamic root path with read/write binding by the control to a reference. |
| **Reset** | Reset the current property to its default value. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

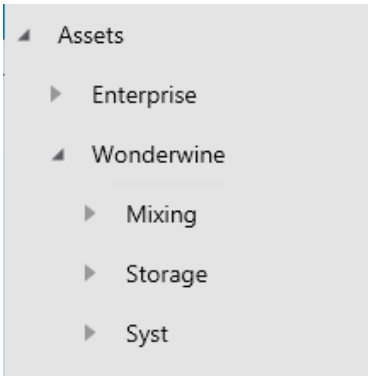



When **Show Root** is selected, the root navigation item appears at the top of the NavigationTree's hierarchical list of navigation items. The root navigation item is the default, selected startup item when a ViewApp starts.

**Show Root = True**




**Show Root = False (Default)**




The root navigation item is a custom navigation item, which supports the following common behaviors of all navigation items:

- The default name of the root navigation item is Home.
- The root navigation item can be renamed like any navigation item.
- The root navigation item can be a reference to an asset or a graphic item.
- The root navigation item can hold custom actions defining layouts and content in layouts.

The following behaviors are specific to the root navigation item:

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- The root navigation item cannot be deleted.
- Sibling items to the root cannot be created.

When **Show Alarms** is selected, alarm counts from the **AlarmCntsBySeverity** attribute are displayed on any NavigationTree item with an active alarm. If the alarm has been aggregated from a contained object, alarms are shown at 50% opacity (transparency) on the containing object. If alarm is on the object, it is shown as a solid color. The alarm color and graphic reflect the severity of the alarm. See Aggregating Alarm State Information for additional information.

Set values for the color and font properties. Select the color property and then select the small triangle at the right of both property fields to show the color picker.

If you want to create event handler scripts, select the **Available Events** field to show a list of NavTreeControl events. For more information about creating event handler scripts, see Add an Event Handler Script.

## Configure the Breadcrumb Control

The NavBreadcrumbControl can be placed in a layout pane to enable path-style navigation. Instead of a hierarchical tree representation of a ViewApp navigation model, a breadcrumb shows a sequential path. Each segment shown in a breadcrumb represents a user selected navigation item in the path.

The following examples of tree and breadcrumb navigation apps show the different visual representations of the current location within a ViewApp navigation model. Both apps show the focus of the ViewApp is currently at the Mixing navigation item. In the case of the NavBreadcrumbControl, the user selects the triangle area within a breadcrumb segment to show the child navigation items beneath the current item. Then, the user continues the navigation path by selecting a child item beneath the current parent item shown in the breadcrumb control.







The NavBreadcrumbControl includes a property to show an Alarm Adorner. An Alarm Adorner shows aggregate alarm counts within the navigation pathway. The alarm count includes the number of alarms by severity (1-4). Semi transparent alarm counts indicate the source of the alarms is a child navigation item of the current item

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

shown in the NavBreadcrumbControl.. Solid Alarm Adorner colors indicate the navigation item that is the source of the alarms.

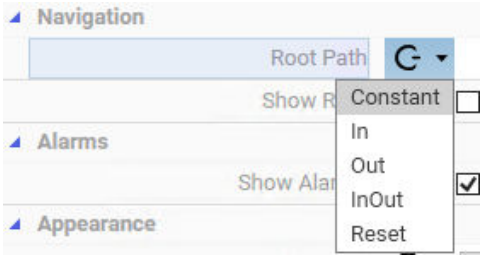



## Configure the NavBreadcrumbControl

Aside from the standard **Content** and **Pane** properties of all objects and graphics, the NavBreadcrumbControl includes several sets of properties:

- **Navigation**: This set of properties determine if the navigation root and path are shown and the starting point of the breadcrumb path within the navigation model.
- **Alarms**: The value of the **Show Alarms** property determines if the NavBreadcrumbControl includes an Alarm Adorner or not.
- **Appearance**: This set of properties specify the font size of text and the foreground and background colors shown on the BreadcrumbControl.

Each property contains a drop-down list of binding options. Some properties only provide a **Reset** option to reset a property value to its default. Other properties allow you to configure dynamic binding values in addition to a static binding.




The type of control property /attribute binding can be specified by selecting a value from the drop-down list.

| | |
|---|---|
| **Constant** | Static binding to the specified path. Enter a value in the data entry field. |
| **In** | Dynamic root path with read only binding by the control to a reference. |
| **Out** | Dynamic root path with write only binding by the control to a reference. |
| **InOut** | Dynamic root path with read/write binding by the control to a reference. |
| **Reset** | Reset the current property to its default value. |

### To configure the NavBreadcrumbControl

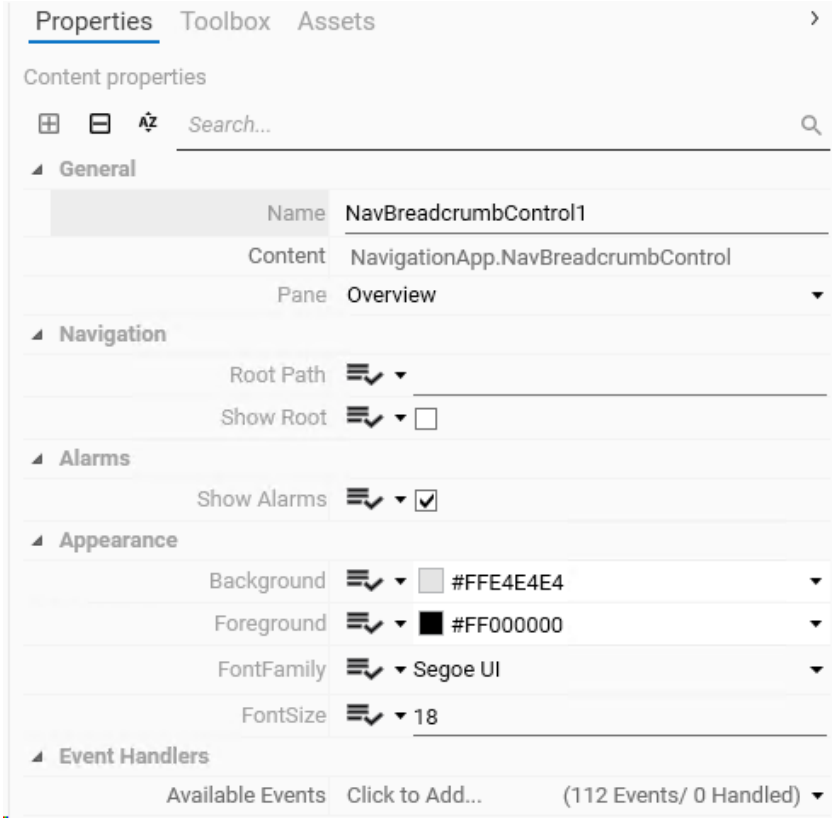
1. Open the Layout or ViewApp Editor and select the **Toolbox** tab.
2. Open the **AVEVA OMI Apps** folder to show the default apps.
3. Select **NavigationApp** from the **Toolbox** list.

   The NavBreadcrumbControl and NavigationTree thumbnails appear beneath the **Toolbox** list.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

4. Drag and drop the NavBreadcrumbControl thumbnail on a layout pane.
5. Select the pane containing the NavBreadcrumbControl and select the **Properties** grid.

   The **Properties** grid shows a list of NavBreadcrumbControl properties.



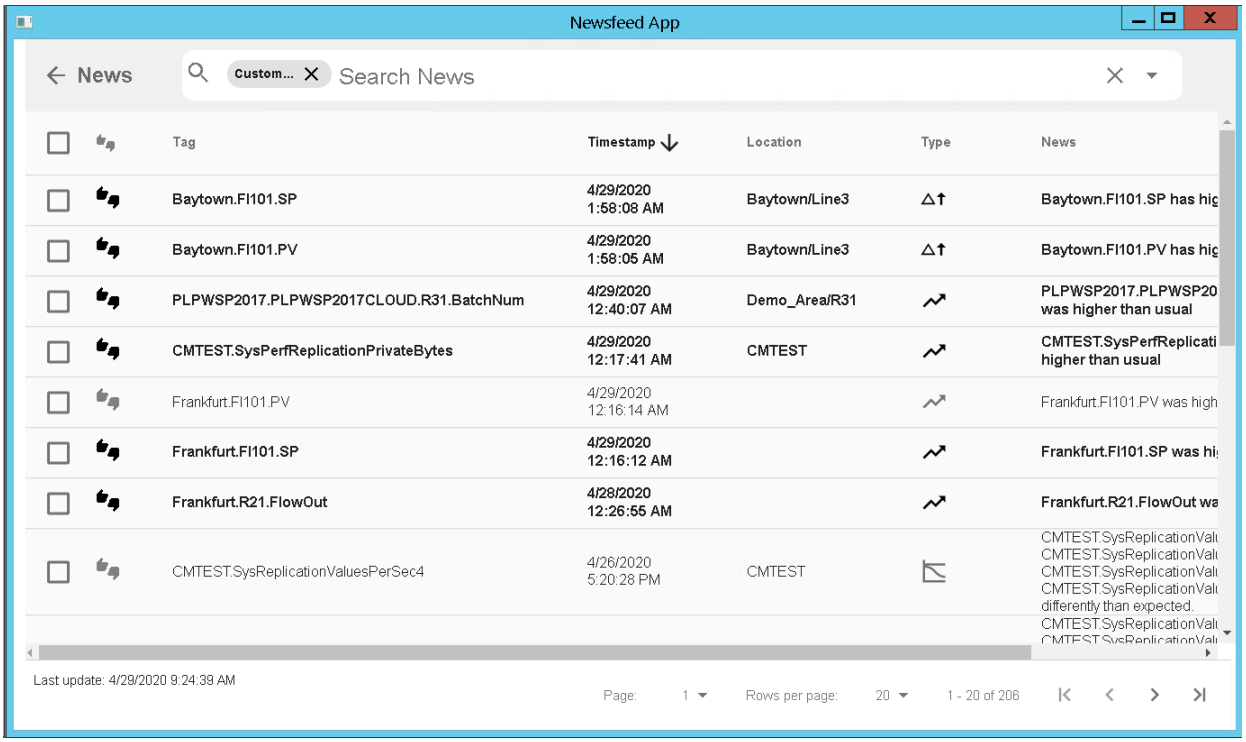

6. Select **Root Path** to load the NavBreadcrumbControl to a specified path. Enabling **Root Path** sets the initial context view of the ViewApp to the specified path.
7. The default is static binding that begins the navigation path at the root of the navigation model.
8. Select **Show Root** if you want the root of the navigation model to appear in the NavBreadcrumbControl.

   By default, the root is not shown.
9. Select **Show Alarms** if you want to show aggregate alarm counts for each navigation node shown by the the NavBreadcrumbControl.
10. Assign values to the **Appearance** properties for color and fonts.
11. If you want to create event handler scripts, select the **Available Events** data entry field to show a list of NavBreadcrumbControl events. For more information about creating event handler scripts, see Add an Event Handler Script.
12. Save your changes.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Chapter 6 Insight Newsfeed OMI App

AVEVA Insight is a cloud platform to collect, store, and visualize data. Insight collects and stores time-series data from multiple, disparate sensors and smart devices. The AVEVA Insight Newsfeed OMI app hereafter known as the Newsfeed app can retrieve selected news feed data from a cloud-based instance of Insight and show the collected data within a running ViewApp. The Newsfeed app enables SCADA operators or other users to view Insight news items directly without requiring a separate browser or mobile app.




The Newsfeed app includes the capability to show Insight records on a trend graph over a selected time period. The Newsfeed app shows an Insight assessment of whether the data records are within an expected range of values for the selected data or not. A trend icon gives users a quick visual aid to identify anomalous data. In addition, the Newsfeed app provides enhanced data filtering and sorting, as well as contextual filtering based on a ViewApp's object hierarchy in its navigation model.

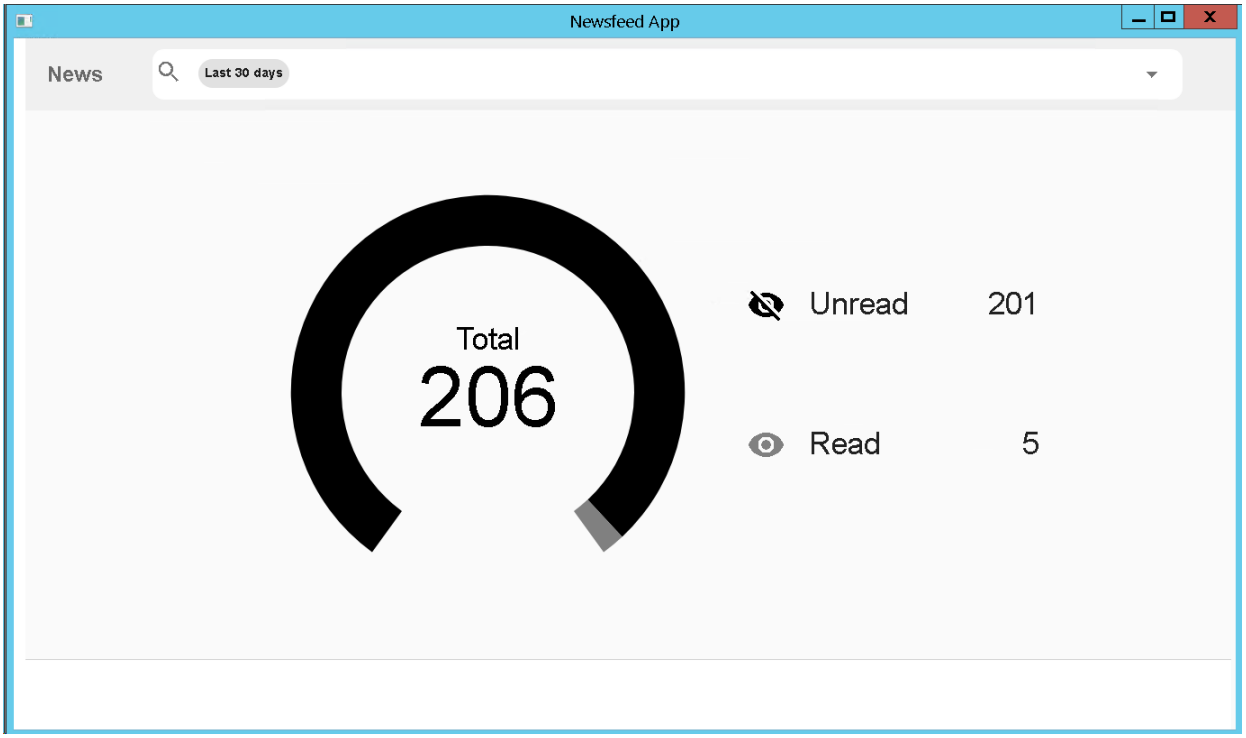
## View Different Levels of News Feed Detail

The Newsfeed app provides a series of connected views to show Insight data. Users can drill down from a summary view of all data to an individual data point shown on a chart.

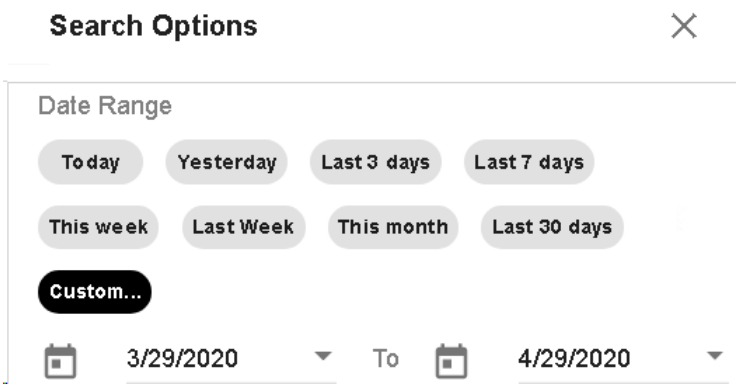
### Summary View

The Newsfeed app initially shows a summary view of Insight data counts when the ViewApp starts running. The view includes hyperlinks to show Insight data based on whether data records have been read before or not. The view also includes a **Total** hyperlink to show all records regardless of whether they have been viewed before or not.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




The summary view includes a set of selectable date range options to show data collected within a specified time range.

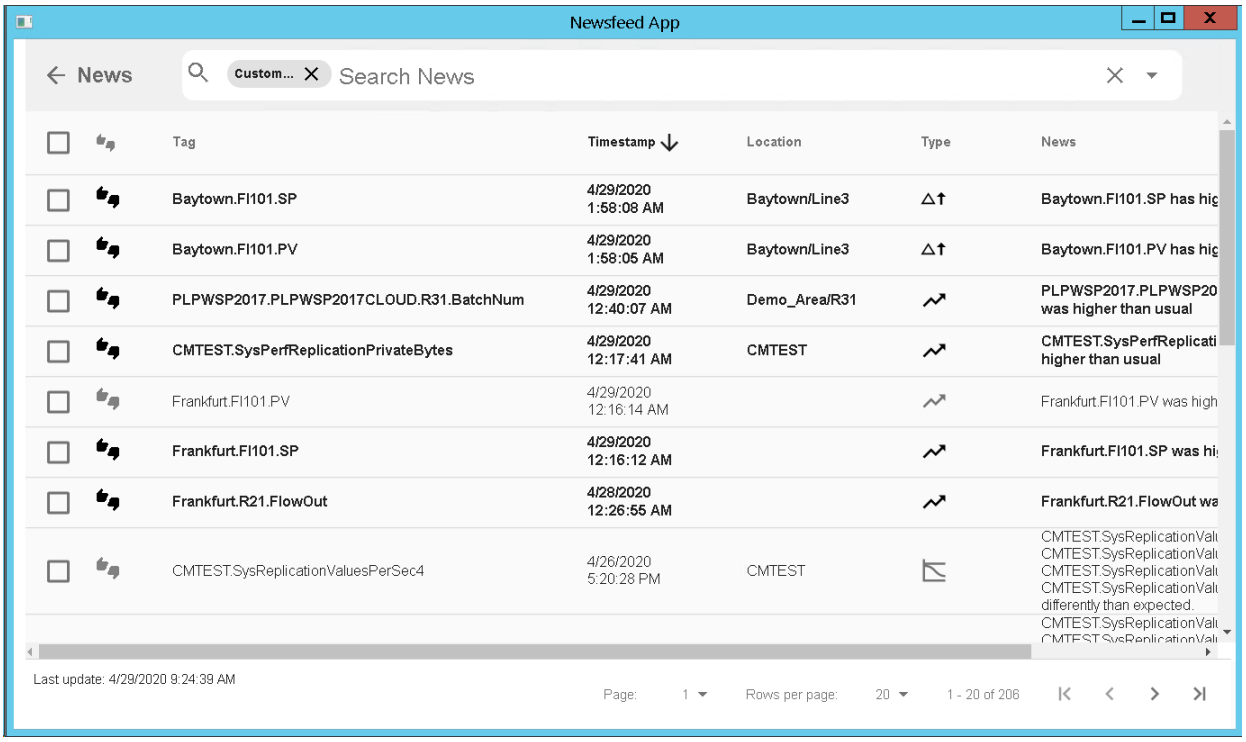



## List View

The list view shows saved Insight data records within the selected date range. The records are shown in chronological order. Selecting the T**imestamp** column title sorts the records in ascending or descending order.

The **Search News** field near the top of the pane lists the active filters for the data shown in the list view.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.



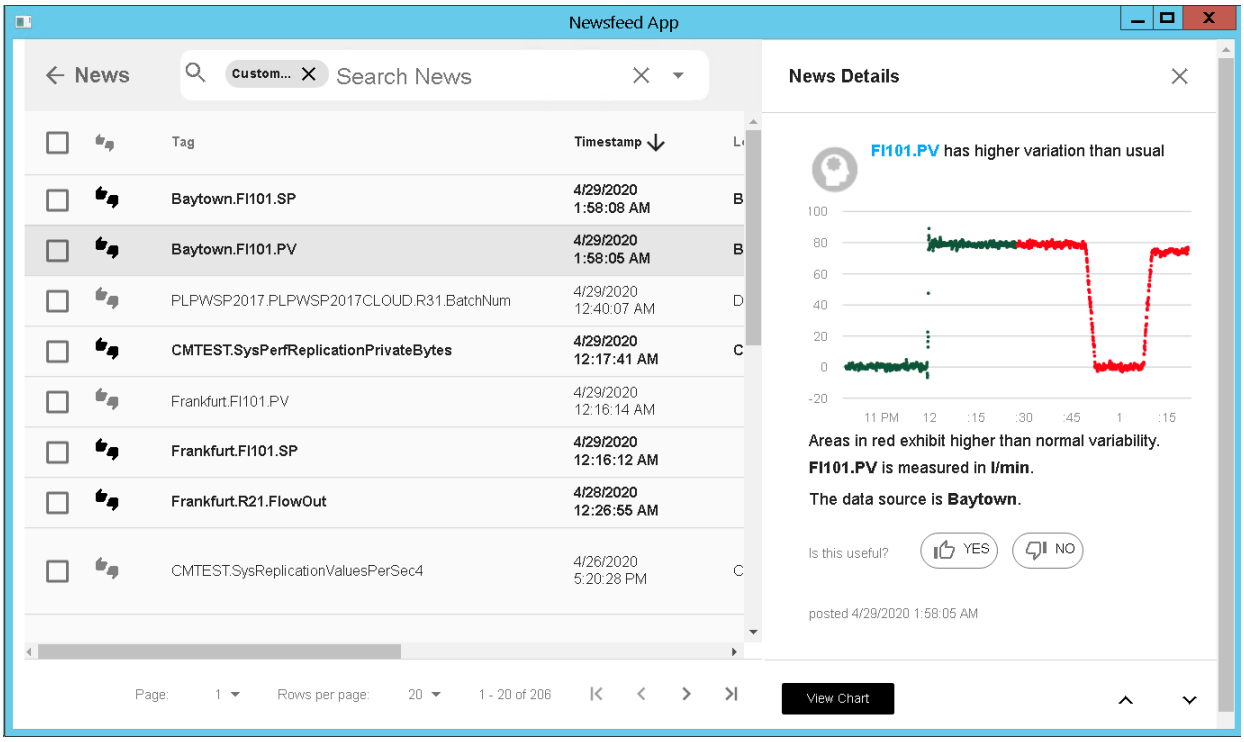

Each row in the list view includes the details of a single data record. The **Type** column shows an icon that indicates the type of data and whether recent data values are ascending or descending. The **News** column provides a short analysis of recent data values.

## Graph View

Selecting a row from the list view shows a trend graph of recent data values. Details of the selected data appear in a **News Details** dialog box that appears at the right of the list view pane.

Graph line color indicates the state of recent data values. Red identifies an anomalous data property. In the following example, the red portion of the graph line indicates recent data values have shown wide variability.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.



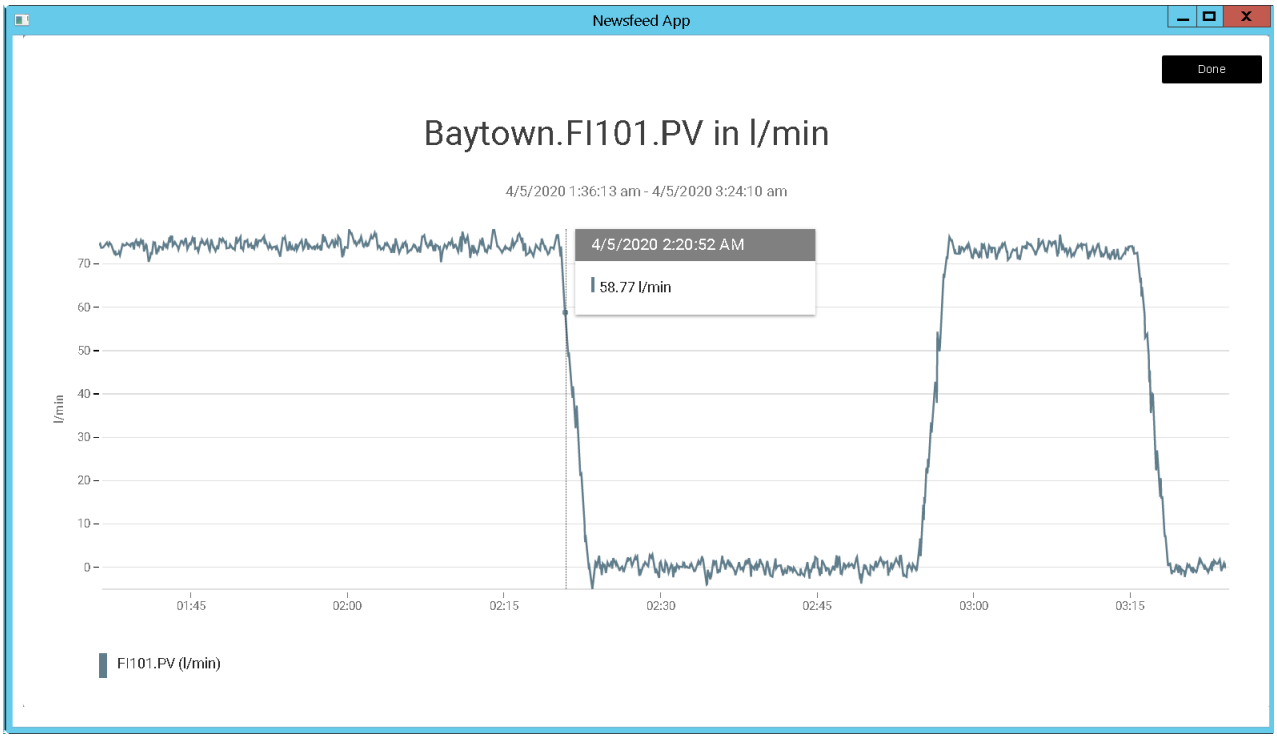

The graph area of the list view includes a pair of options that identify if the graph view is useful. The usefulness state of data can be used as a search criterion to filter the data shown in a Newsfeed app view.

Selecting the **View Chart** button near the bottom of th graph area of the list view, shows the chart view of the Newsfeed app.

## Newsfeed App Chart View

The chart view shows an expanded view of data shown in the graphic view. The chart shows time in 15 minute increments on the horizontal axis. The value of data appears on the vertical axis.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




Placing the cursor directly over the chart shows the current data value in a popup window for time at the cursor position.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Chapter 7 Configure the Newsfeed App

This chapter describes how to import and configure the Newsfeed app.

Configuring the Newsfeed app consists of three major steps.

- Import the Newsfeed app
- Assess and complete all Insight and System Platform prerequisites
- Configure Newsfeed app properties

## Prerequisites

Before you configure the Newsfeed app, you must

- Gather information about the instance of Insight that will provide the data shown by the Newsfeed app
- Be authorized as an Insight administrator and logged on to Insight to obtain access tokens
- Have enough experience with System Platform to be able to create screen profiles, layouts, and ViewApps

### Insight Requirements

You need the following information about your Insight solution. This information is used to configure the Newsfeed app to connect to Insight and retrieve stored news items.

- Base URL of the Insight solution that will provide news items to the Newsfeed app.
- Insight retrieval endpoint to the news items that will be shown by the Newsfeed app.
- Insight access token

  **Note**: You must be logged on and an Insight administrator to be able to obtain an access token.

For enhanced optional network security, Insight provides DMZ Secure Link, which is a forward-proxy component that supports secure control and business networks incorporating firewalls separated by a DMZ. Communication from one network to the other must go through the DMZ by DMZ Secure Link. DMZ Secure Link permits access only to sites specifically used by Insight and blocks attempts to access other sites.

DMZ Secure Link runs on a computer that is separate from the one running AVEVA Publisher and the one accessing AVEVA Insight. DMZ Secure link must be on the computer acting as the bridge for either the publisher or Insight computer to the internet. For more information about configuring optional network security with DMZ Secure Link, see the *Download and use DMZ Secure Link* topic in the Insight online help.

### System Platform Requirements

Before starting your work with the Newsfeed app, ensure the following System Platform requirements have been met:

- System Platform 2017 Update 3 Service Pack 1 or later versions of System Platform must be fully installed and all AVEVA licenses activated.
- System Platform users must be assigned to either **OS User based** or **OS Group based** authentication mode.
- System Platform users must be proficient enough with System Platform to be able to create a screen profile, a layout, and incorporate them into a ViewApp.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- A screen profile, layout, and ViewApp should be created and ready for use before configuring the Newsfeed app.

See the InTouch OMI help for more information about creating screen profiles, layouts,and a ViewApp.

## Security Requirements

The Newsfeed app requires an Insight access token and a local cache password:

- The access token stores an API key to access Insight services and data.
- The password enables access to a cache folder on the user's computer that stores Insight news items.

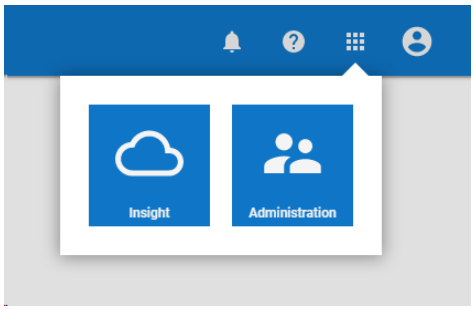
The access token and password must be entered as values of the **Access Token** and **Password** properties while configuring the Newsfeed app.

### Obtain an Insight Access Token

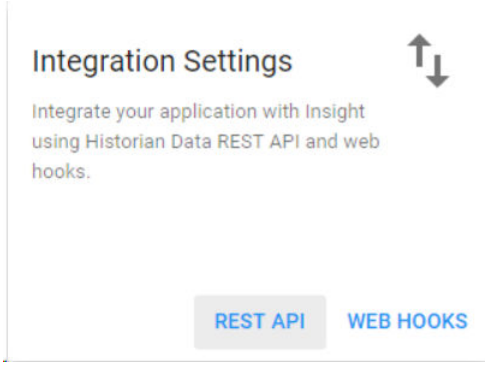
The Newsfeed app requires a token to access Insight services and data

**To obtain an Insight access token**

1. Using a web browser, open the Insight URL.
2. Access the **Administration** area.

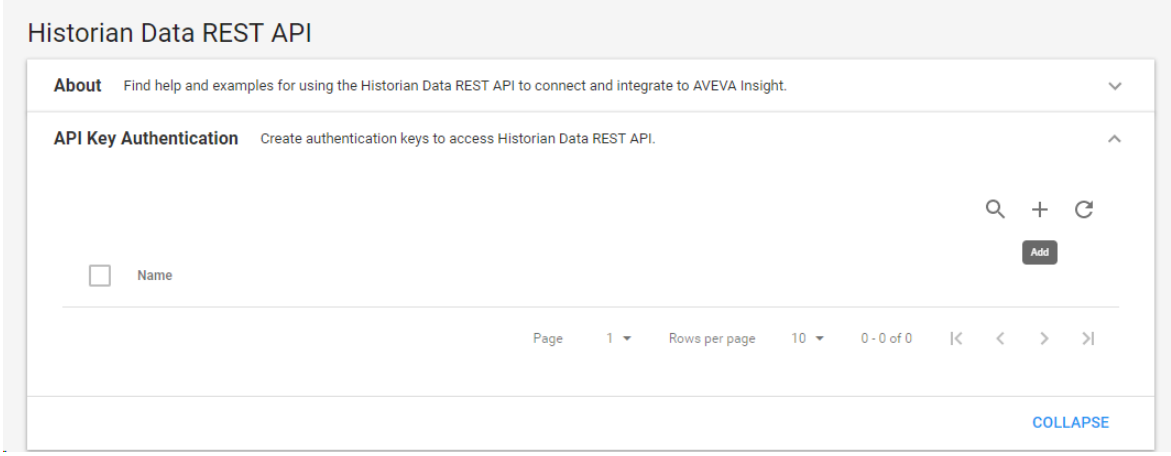



3. Within the **Integration Settings** area, select **REST API**.

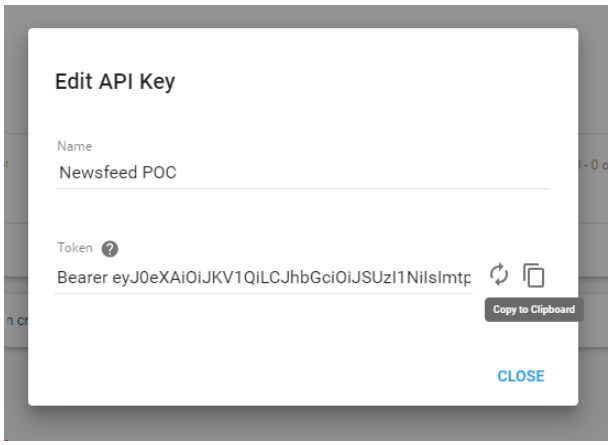



4. Within the **API Key Authentication** area, select **Add**.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




5. Assign a name to the key.




   Assigning a name creates the key.

6. Select **Copy to Clipboard** to save the key in memory.

   You will need to paste the token

## Create a Cache Password

The Newsfeed app requires a password to access a cache folder on the user's computer that stores Insight news items. The password must be entered as the value of the **Password** property while configuring the Newsfeed app.

**Note:** The password is stored within a named credential that you create. You must create a named credential before adding a cache password. For more information about creating a named credential, see the *Create Named Credentials* topic in the InTouch OMI help.

### To associate an access token to a password

1. Open the ArchestrA IDE.
2. Ensure that all assets and templates are undeployed and checked in.
3. Open the **Configure Security** dialog box.
   a. Select **Galaxy** from the menu bar to show a list of options.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

b. Select **Configure**, and then select **Security**.

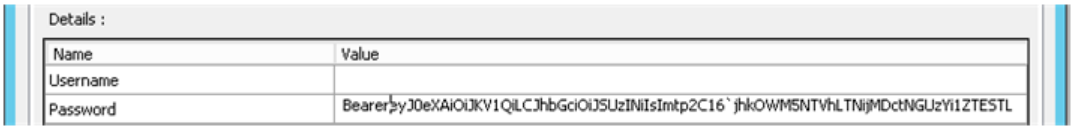
The **Configure Security** dialog box appears with a set of tabs.

4. Select the **Credentials** tab.
5. Select the plus button to add a credential.
6. In the **Available Credentials** field, enter the name of a credential that will be assigned as the access token for Insight.




7. In the **Details** field, select the **Value** field of the **Password** row.

The **Username** field is not used and can be left blank.




The field updates to show the API key associated with the credential.

8. Select the plus button to add the second credential for the cache folder.
9. In the **Available Credentials** field, enter the name of a credential that will contain the password for the Insight data cache.
10. In the **Details** field, enter a password in the **Value** field of the **Password** row.
11. Select **OK** to exit.

## Import the Newsfeed App

The Newsfeed app must be imported to a computer hosting the Galaxy Repository and the AVEVA Development Studio.

**To import the Newsfeed app into a Galaxy**

1. Unzip the InsightNewsfeedApp.zip file.
2. Copy the InsightNewsfeedApp.aaPKG file to a location that is accessible to the computer hosting the AVEVA Development Studio, which includes the ArchestrA IDE.
3. Launch the System Platform IDE.
4. Import the InsightNewsfeedApp.aaPKG file into the Galaxy.
   a. Select **Galaxy** from the menu bar of the ArchestrA IDE.
   b. Select the the **Import** option and then select **Object(s)**.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

The **Browse For Folder** dialog box appears to locate the InsightNewsfeedApp.aaPKG file.

c. Locate the folder containing the InsightNewsfeedApp.aaPKG file.

d. Select the InsightNewsfeedApp.aaPKG file and select **OK**.

The **Import ArchestrA App** dialog box shows the progress of importing the app.

5. After the import is completed, show the **Graphic Toolbox**.

You should see InsightNewsfeedApp at the root of the **Graphic Toolbox**.

If the import failed, refer to the aalogger for details.

6. If you want, rename the app by right-clicking on it and selecting **Rename** from the shortcut menu.

## Configure the Newsfeed App

The following procedure explains the workflow to place the Newsfeed app onto a layout pane and configure it for use with an instance of Insight.

Before configuring the Newsfeed app, you should have completed the following tasks:

- You should have already created a screen profile, a layout, and ViewApp.
- You should have associated the screen profile and layout to a ViewApp using the **Initialization Wizard**.
- You should have created a pair of credentials to access Insight data and protect the locale cache on the user's computer.

### To configure the Newsfeed app

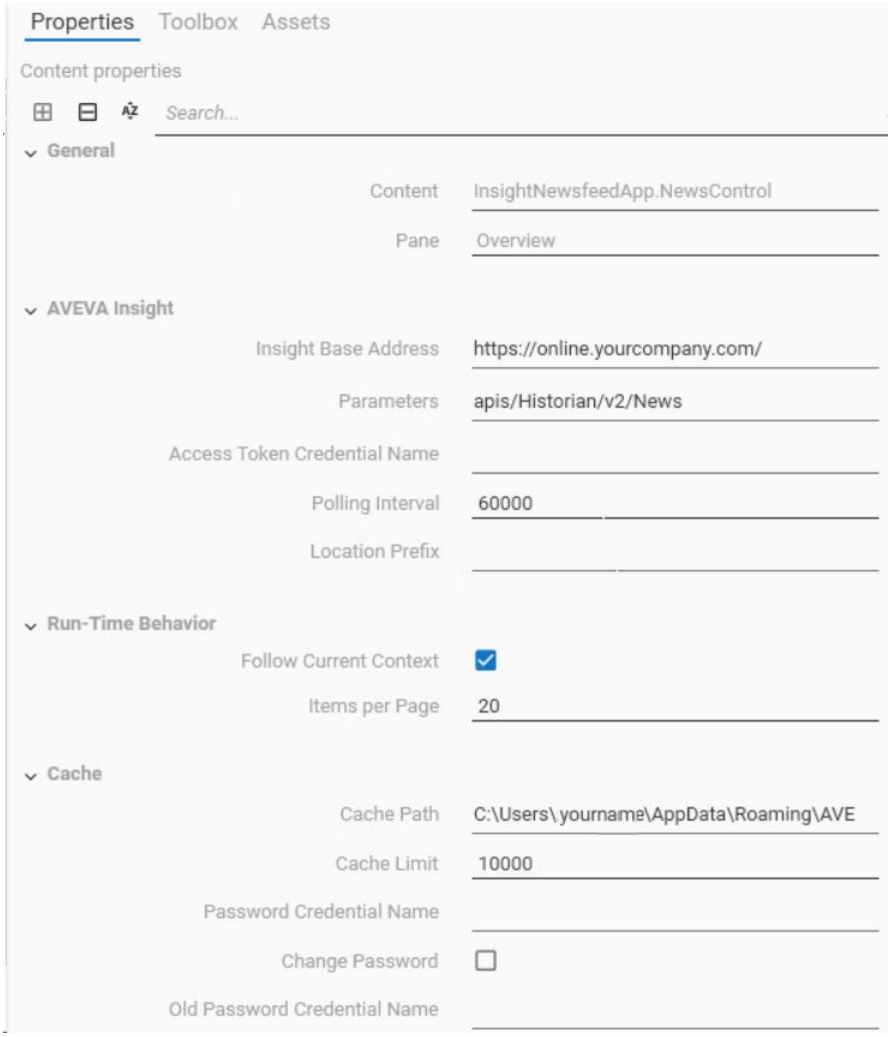
1. Open the ArchestrA IDE
2. Select the **Graphic Toolbox** tab and select the layout associated with the ViewApp.

The Layout editor should open and show the panes associated with the layout.

3. Select a pane from the layout to place the Newsfeed app.
4. Select **Toolbox** to locate the Newsfeed app.
5. Select the Newsfeed app to show its thumbnail beneath the **Toolbox** list.
6. Drag and drop the Newsfeed app thumbnail onto the pane you selected.
7. Select the Newsfeed app thumbnail and select the **Properties** tab.

The **Properties** tab shows the properties of the Newsfeed app.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




8. Assign values to the Newsfeed app properties.

   The table following this procedure describes each Newsfeed app property.

9. Save your changes.

| **AVEVA Insight** | |
|---|---|
| **Insight Base Address** | URL base address to the instance of AVEVA Insight providing data to the Newsfeed app. The URL can identify the location of AVEVA Insight on a local web server or a remote cloud server. |
| **Parameters** | Retrieval endpoint to obtain data from Insight to show in the Newsfeed app. |
| **Access Token Credential Name** | Name of the credential that stores th API token to authorize access to Insight data, which is an API key to access the Historian REST API. |
| **Polling Interval** | Length of the polling interval in milliseconds to obtain new data from Insight. The default polling interval is one minute (60000). |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| **Location Prefix** | String value that specifies a location prefix to filter Insight data. The InsightNewsfeed app restricts the display of records to those that match the location prefix. For example, if Lake Forest is specified as the **Location Prefix** value and the user selects Area1\SH002 from the Insight asset hierarchy, the Newsfeed app only shows the Lake Forest\Area1\SH002 records.<br>The default is an empty value. |
| **Runtime Behavior** | |
| **Follow Current Context** | The value assigned to the **Follow Current Context** property determines if the Newsfeed app responds to context changes within the navigation model of a ViewApp and shows data for the currently-selected context. When set to True, the displayed Insight data items are from the selected area or asset items of a Viewapp navigation model.<br>The default is true to show data items from the current context of the ViewApp. |
| **Items per Page** | Number of data rows shown within the Newsfeed app window. The default is 20. |
| **Cache** | |
| **Cache Path** | Folder path to the Insight data service cache folder on the user's computer. This cache stores news items locally.<br>The default cache location is the logged on user's AppData\Roaming folder, which is<br>`c:\\users\`*`username`*`\AppData\Roaming\AVEVA Insight`. |
| **Cache Limit** | Maximum number of records stored in the NewsfeedApp data cache. 10000 is the default cache limit.<br>When the number of records exceeds the maximum cache limit, the records are sorted in descending chronological order and only the most recent records within the maximum limit are retained. Older records beyond the maximum limit are removed from the cache and no longer shown in the NewsfeedApp view. |
| **Password Credential Name** | Name of the credential containing the password to access the local Insight data service cache. The default cache at the user's AppData\Roaming folder does not require a password and the property can be left blank. |
| **Change Password** | When selected, the current cache password must be changed. A new password must be created and the name of the old cache credential must be entered in the **Old Password** property.<br>The default is to maintain the current password. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| **Old Password Credential Name** | Name of the credential that stores the old password when changing to a new password. |

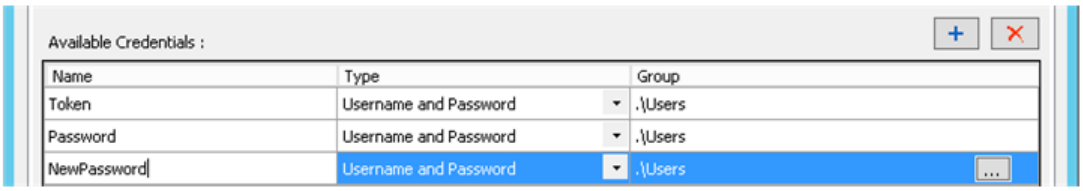
# Change the Password of the Insight Data Cache

This topic describes the workflow to change the password of the Insight data cache located on the user's computer.

### To change the password of the Insight data cache

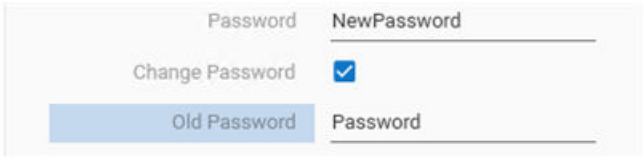
1. Open the ArchestrA IDE.
2. Ensure that all assets and templates are undeployed and checked in.
3. Open the **Configure Security** dialog box.
   a. Select **Galaxy** from the menu bar to show a list of options.
   b. Select **Configure**, and then select **Security**.

   The **Configure Security** dialog box appears with a set of tabs.
4. Select the **Credentials** tab.
5. Select the plus button to add a credential.
6. In the **Available Credentials** field, enter the name of a new credential that will contain the new password for the Insight data cache.




7. In the **Details** field, enter a new password in the **Value** field of the **Password** row.
8. Select **OK** to exit.
9. Select the **Graphic Toolbox** tab and select the layout associated with the ViewApp containing the Newsfeed app.
10. Select the Newsfeed app thumbnail in a layout pane and select the **Properties** tab.

    The **Properties** tab shows the properties of the Newsfeed app.
11. Enter the credential name containing the new password in the **Password** field.
12. Select **Change Password**.
13. Enter the credential name containing the old password in the **Old Password** field.




14. Save your changes and exit from the Layout editor.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

15. Follow the instructions described in Deploy and Run the ViewApp to display the Newsfeed app during runtime.

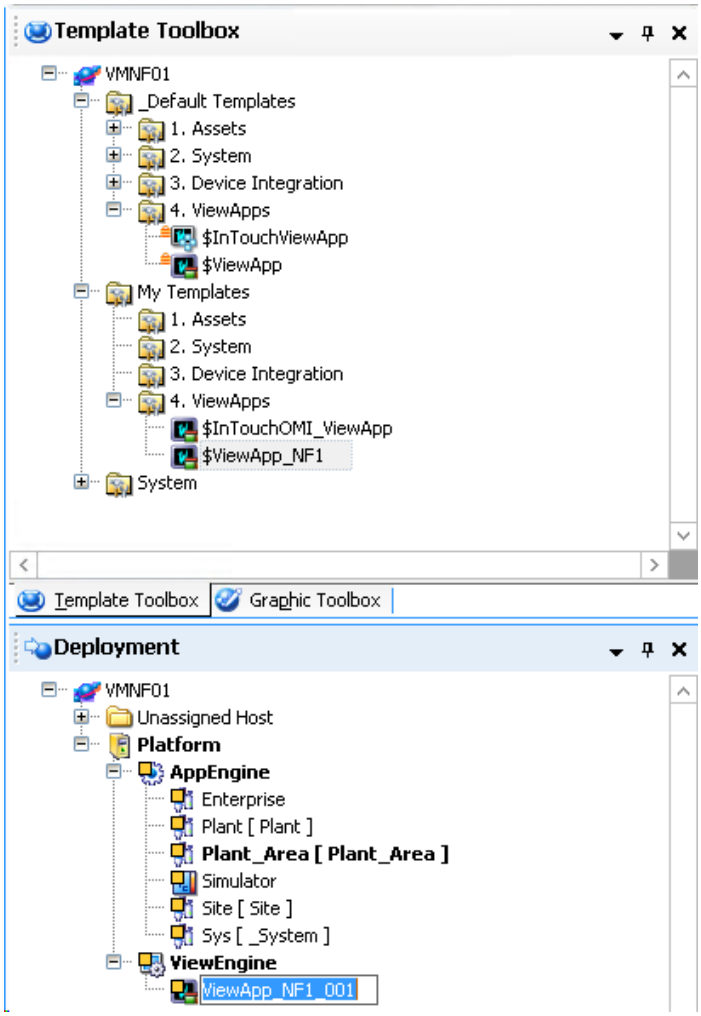
## Deploy and Run the ViewApp

Deployment instantiates objects in a runtime environment, which are required to run a ViewApp. Deployment includes installing the necessary software on a target computer to support objects. You must deploy your environment before attempting to run a ViewApp.

**To deploy and run the ViewApp containing the Newsfeed app**

1. Open the ArchestrA IDE if necessary.
2. Select the **Deployment** tab to show a set of system and user objects that are created to support a default ViewApp that comes with System Platform 2017 Update 3.
3. Drag the ViewApp derived template that includes the configured Newsfeed app to the **Deployment** view and drop it.

   System Platform creates an instance of the ViewApp derived template and places it beneath the **ViewEngine** object.

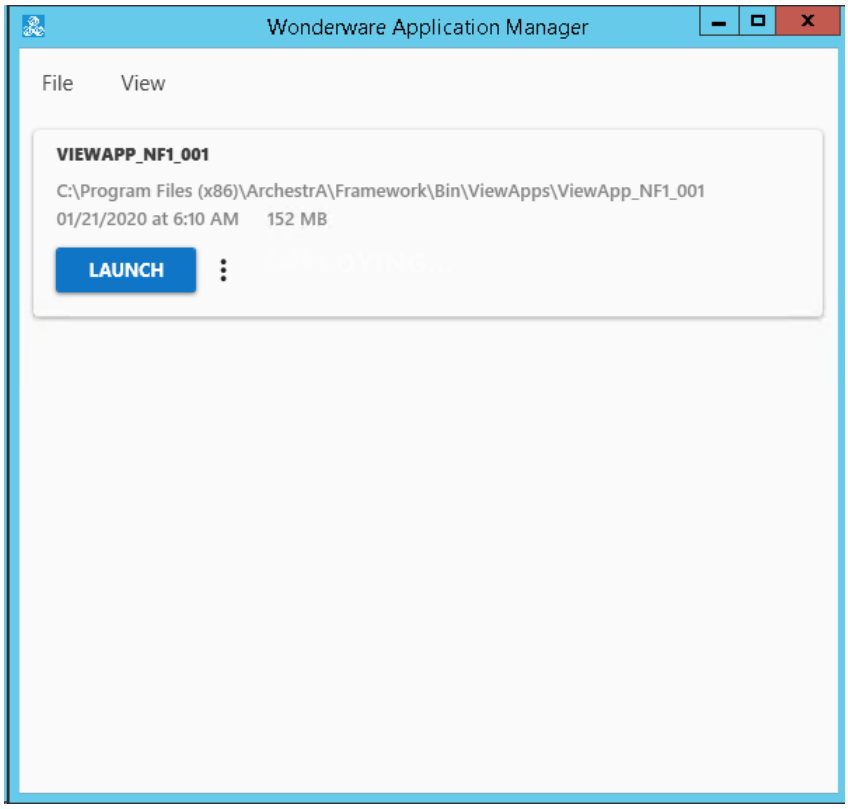



   The yellow icon next to each object in the **Deployment** view indicates the object is undeployed.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

4. In this example, right-click on the **Platform** object to show a shortcut menu with a list of options.
5. Select **Deploy** from the shortcut menu and select **OK** from the **Deploy** dialog box.

   The **Deploy** dialog box shows status messages while objects are being deployed. A **Deploy complete** message appears after all objects have been deployed. The yellow icons next to all objects should be hidden, indicating the objects are deployed.
6. Close the **Deploy** dialog box and minimize the ArchestrA IDE to your Windows task bar.
7. Locate the **Wonderware Application Manager** icon on your Windows desktop and select it.




8. Select **LAUNCH** to start the ViewApp.

   After several seconds, the ViewApp containing the Newsfeed app should appear in its own window.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Chapter 8 Using the Newsfeed App During Runtime

During runtime while the Newsfeed app is shown in a ViewApp, a set of visual controls enable users to select the Insight data shown by the Newsfeed app and how the data appears in the Newsfeed pane.

## Select Data to Appear in the Newsfeed App

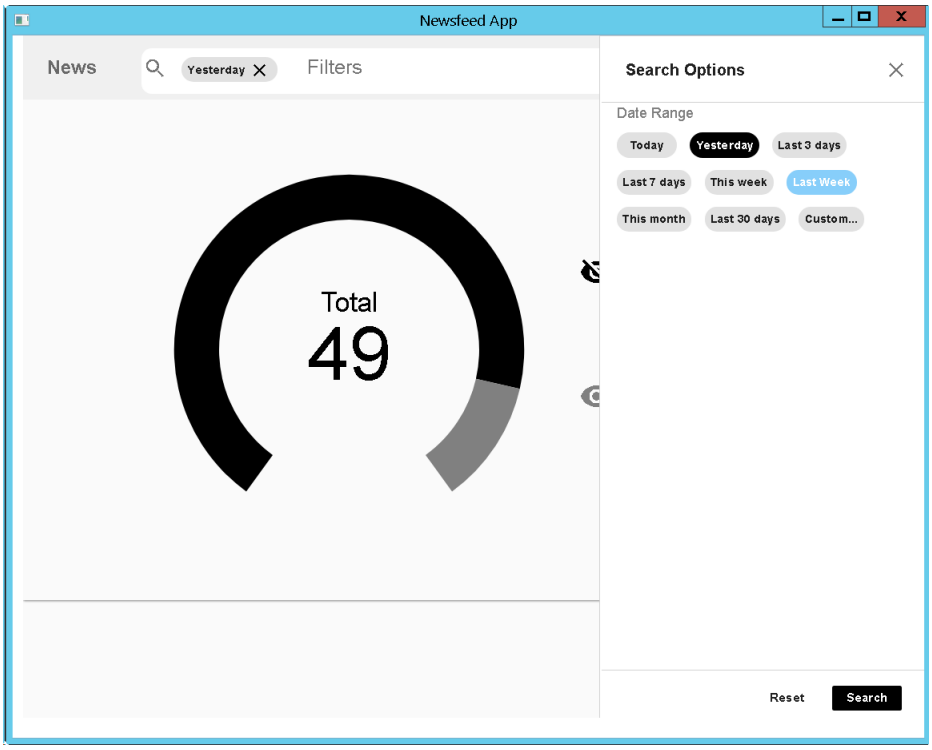
Data can be selected to appear in the Newsfeed app by the following criteria:

- Date range in which the data was saved to the Insight database
- Read or unread status of a data record specified by the user
- Useful or not useful status of a data record specified by the user

The following tables lists Newsfeed app views and what data selection controls appear in the views.

| Newsfeed Views | Date Range | Read Status | Useful Status |
|---|---|---|---|
| Summary | Yes | Yes | No |
| List | Yes | Yes | Yes |
| Graphic | No | No | Yes |
| Chart | No | No | No |

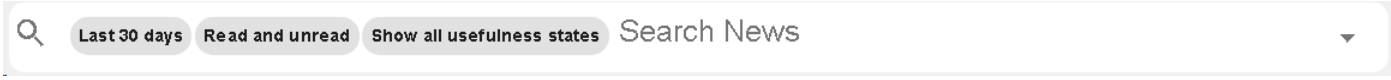
As shown in the table, you can select a date range from the summary and list views.The summary view includes only the date range search option in the **Search Options** field.



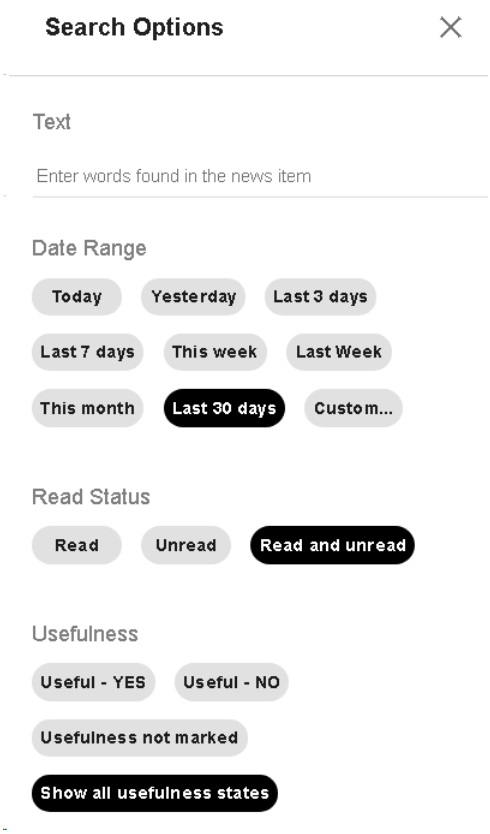

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

After you select a **Date Range** option, select **Search** to refresh the page with the data from the date range you selected.

For the list view, select any of the data selection options shown in the **Search News** field to show all data selection options.




The **Search Options** window opens to show all options for each data selection criterion and the current selected value.



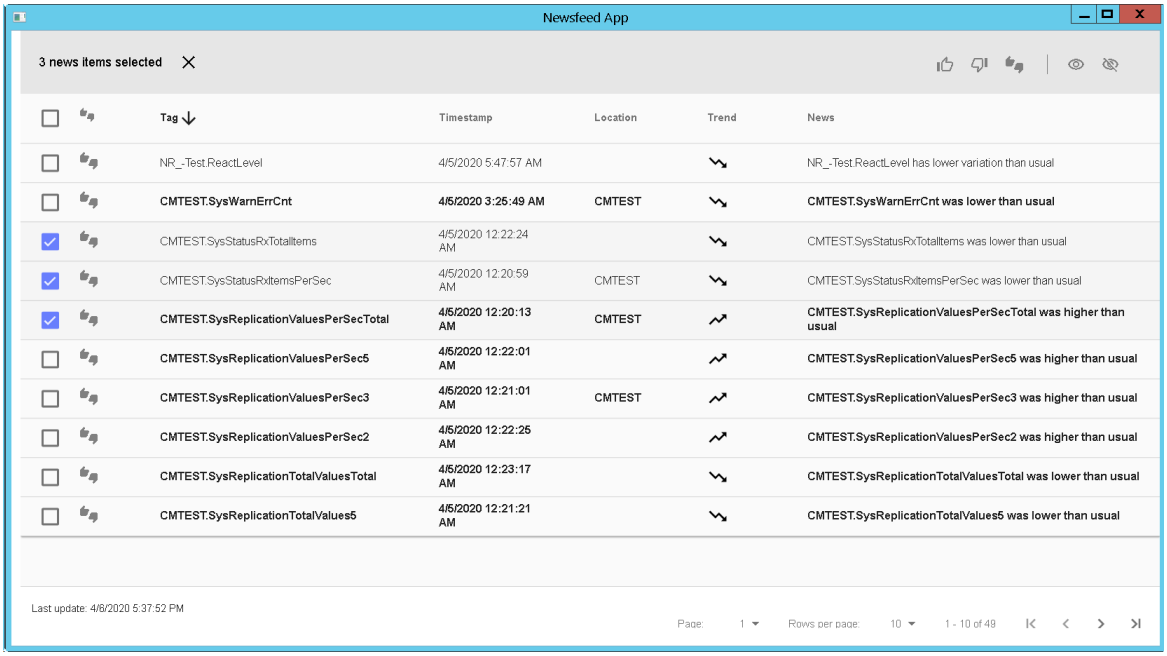

## Select Data by Read Status or Usefulness

Users can select specific data records to appear in a Newsfeed app view by whether they have been read or not and if the records are useful or not. These two search criteria enable users to create custom views within the Newsfeed app that filter out everything from a view except the desired data.

A data record shown by the Newsfeed app can be read, unread, or read and unread.The summary view provides individual links to views that show data records assigned to one of the read status options.

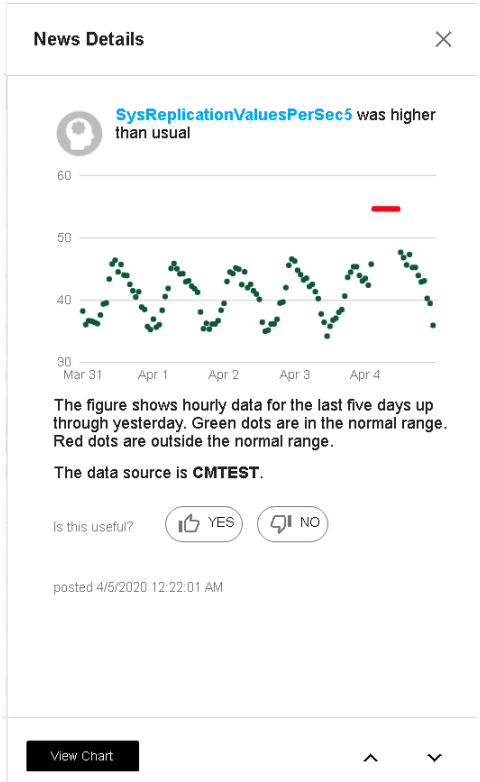
You can set the read status of data records shown in the list view. Select the checkbox to the left of the data records. Four icons appear at the right of menu bar. Select one of the icons at at the right, which are are **Mark as Read** and **Mark as Unread**. The read status of the data records are updated.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




Users can specify if a data record shown by the Newsfeed app is useful or not. You can set the usefulness status of data records shown in the list view.

You can set the usefulness status of a single data record from the graphic view. Select one of the usefulness buttons shown in the lower portion of the graphic window.




To set the usefulness status of multiple data records, select the checkbox to the left.. Four icons appear at the right of menu bar. Select one of the icons at at the left which are are **Mark as Useful** and **Mark as Not Useful**.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

The usefulness status of the data records are updated. Also, the paired thumbs icon next to the checkbox shows the assigned usefulness status. A thumb up is useful and a thumb down is not useful.

## Format Data Shown by the Newsfeed App

Data can be shown in the Newsfeed app by the following visual criteria:

- Number of data records shown on a Newsfeed app page
- Sort order of data records shown by the Newsfeed app

The list view provides controls to set the number of records shown on a pane and how the data records are sorted. By default, the Newsfeed app shows five rows of Insight data records in the page. Additional records can be shown on a page by selecting **Rows per page** near the bottom of the page and selecting the number of rows to be shown from the list.




Data shown in the Newsfeed app can be sorted in ascending or descending order based on the type of alphanumeric data shown in the selected column. Selecting a column header toggles the order of data in ascending or descending order. An arrow pointing up or down next to the column title indicates the sort order. The following example shows Newsfeed app data sorted by date and time by toggling the **Timestamp** column header.

| Timestamp ↓ |
| --- |
| 1/20/2020 7:12:46 AM |
| 1/20/2020 4:27:36 AM |
| 1/20/2020 3:04:01 AM |
| 1/20/2020 2:43:20 AM |
| 1/20/2020 2:22:24 AM |
| 1/20/2020 1:20:41 AM |

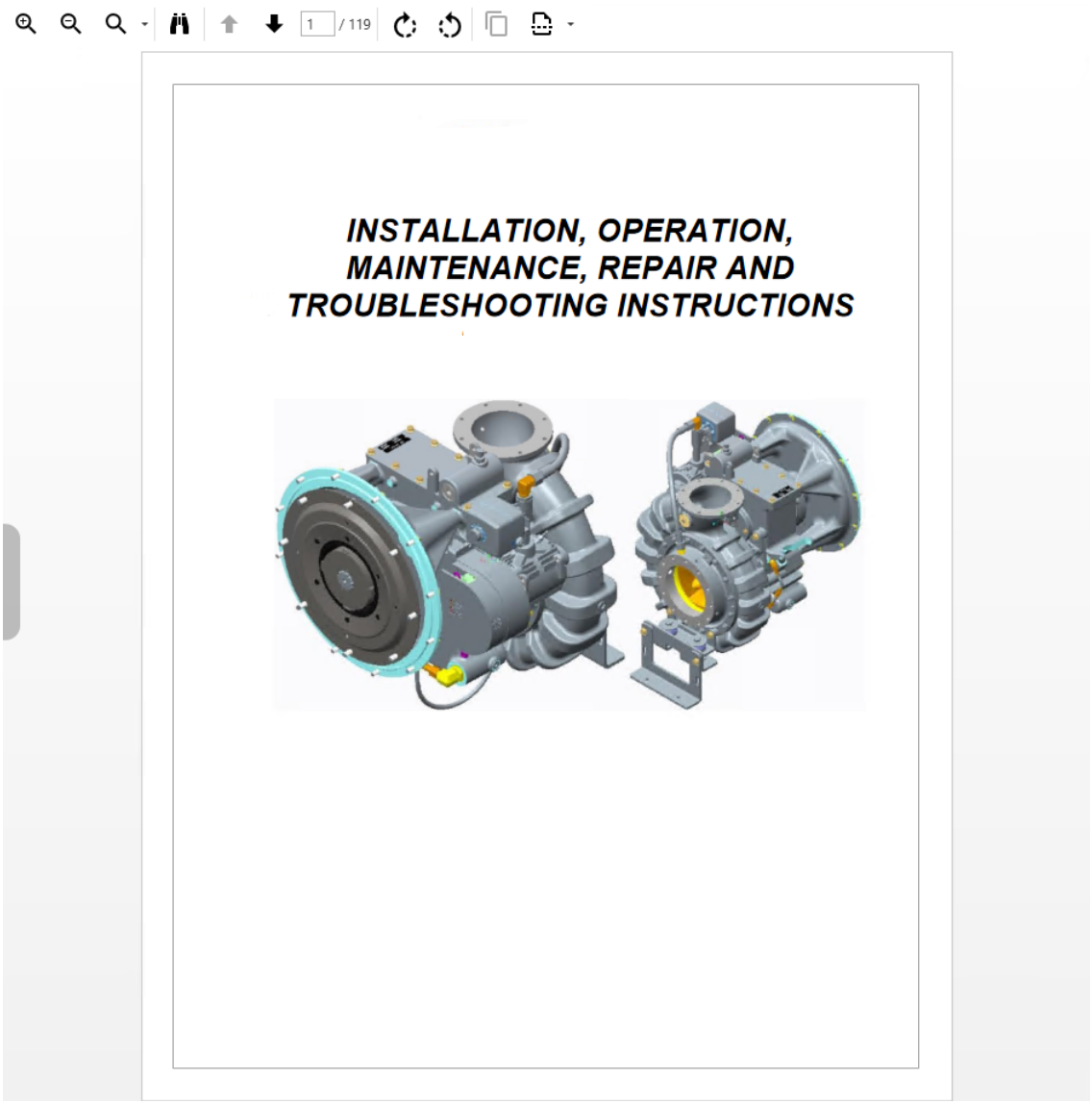
| Timestamp ↑ |
| --- |
| 12/24/2019 1:35:00 AM |
| 12/24/2019 4:19:20 AM |
| 12/24/2019 11:54:17 AM |
| 12/24/2019 5:22:19 PM |
| 12/24/2019 6:03:38 PM |
| 12/25/2019 12:30:30 AM |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Chapter 9 PDFViewerApp

The PDFViewerApp shows a Portable Document Format (PDF) document within a pane of a ViewApp in preview mode or while a ViewApp is running. The PDFViewerApp initially shows the first page of the document at 100 percent zoom scale.

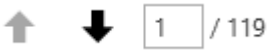
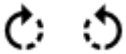



The PDFViewerApp includes a set of visual controls that appear above the displayed PDF document on the menu bar. Users can select these controls to change the visual appearance of a PDF document while it is being displayed, but cannot make any permanent editing changes.




| | |
|---|---|
| | Zoom controls to zoom in or out of the current page shown from a PDF document. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
|  | Find control to search the contents of the displayed PDF document. |
|  | Page controls to scroll forward or backward through a PDF document. |
|  | Orientation controls to rotate the PDF document 90 degrees clockwise or counterclockwise. |
|  | Copy control to copy selected content from a displayed PDF document. |
|  | Page view controls to set the number of pages shown by PDFViewerApp and the type of scrolling. |

## Change the View of a PDF Document

The PDFViewerApp provides several methods to set the zoom level of the page shown from a ViewApp. A page can be zoomed out to a minimum of ten percent of its original size or zoomed into a maximum of 500 percent.

- Zoom in and Zoom out controls

  The control shown at the right includes a drop-down list to select a specific zoom level. The list also includes other options to set the zoom level to:

  - Actual Size
  - Zoom to the Page Level
  - Fit Width
  - Fit Visible

- Keyboard shortcuts

  Users can select keyboard shortcuts to change the zoom level of a page.

  - Zoom in by pressing Ctrl + key showing the plus sign (+)
  - Zoom out by pressing Ctrl + key showing the minus sign (-)
  - Zoom to 100 percent by pressing Ctrl + 1
  - Zoom to page level by pressing Ctrl + 0
  - Zoom to fit width by pressing Ctrl + 2
  - Zoom to fit visible by pressing Ctrl + 3

## Search Within a PDF Document

The PDFViewerApp includes the capability to search for a word or phrase within an open PDF document during preview mode or runtime. Users invoke the search utility by selecting the **Find** control above the open document or using the **Ctrl + F** keyboard shortcut.

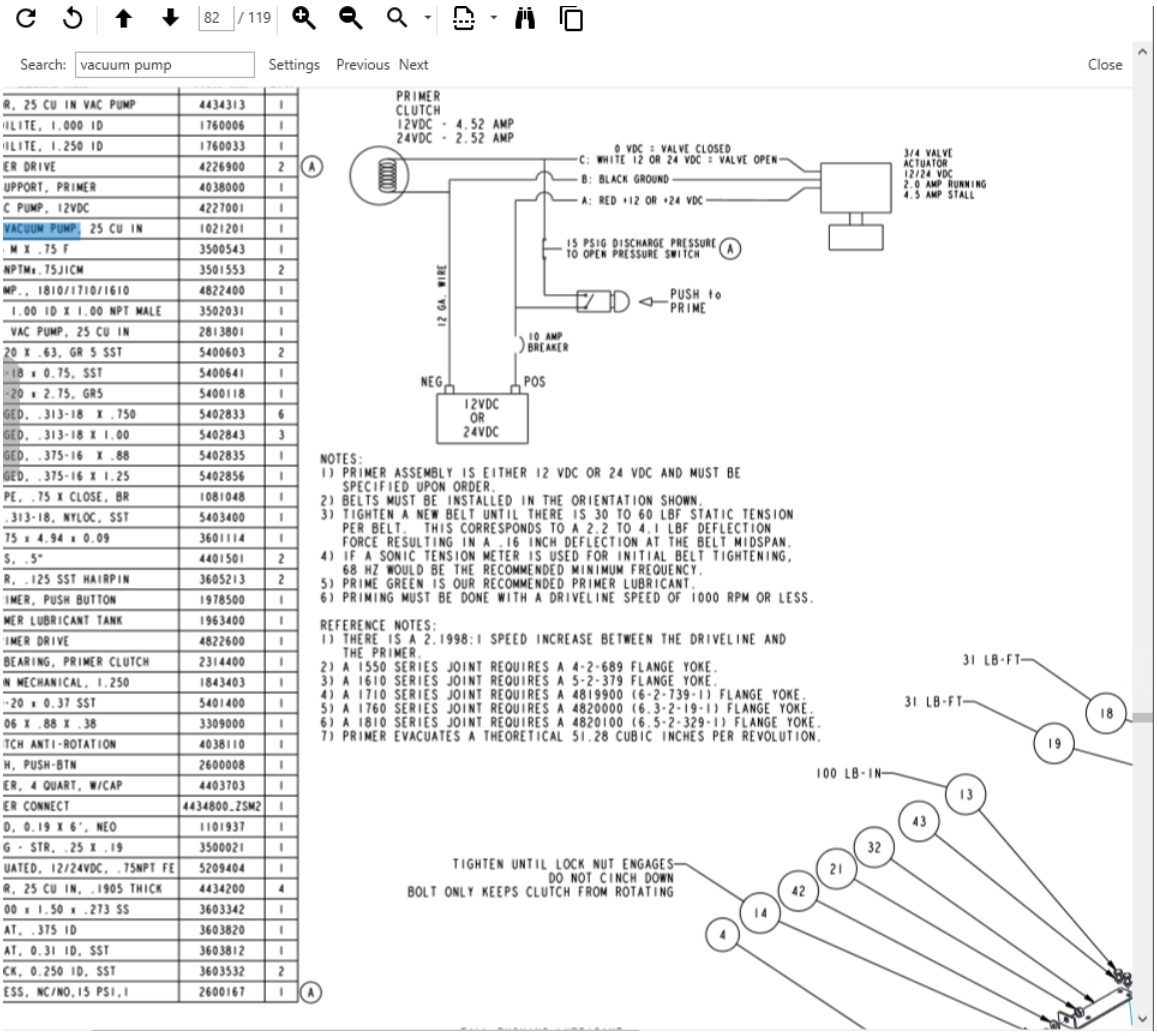
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.



A search field appears to type the search item after selecting **Find**.




If the PDF document includes the word or search phrase, the view shifts to the first page containing the search item and highlights the matching word or phrase on the page. Users can select the **Previous** or **Next** search options to continue the search within the document backward or forward from the current displayed page.



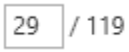

## Navigate Within a PDF Document

Based on the current page shown by the PDFViewerApp, users can select a visual scroll control to show the next page or backward to the previous page. The PDFViewerApp also supports page scrolling by pressing the Page Up and Page Down keys or the Up and Down arrows keys. Users can also scroll rapidly through the pages of a document by rotating their mouse wheel forward or backward, or by moving the vertical window scrollbar by touch or a mouse.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

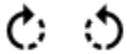


The PDFViewerApp also includes a control to show a specific page of a document by entering the page number and pressing the Enter key.




## Change the Orientation of a PDF Document

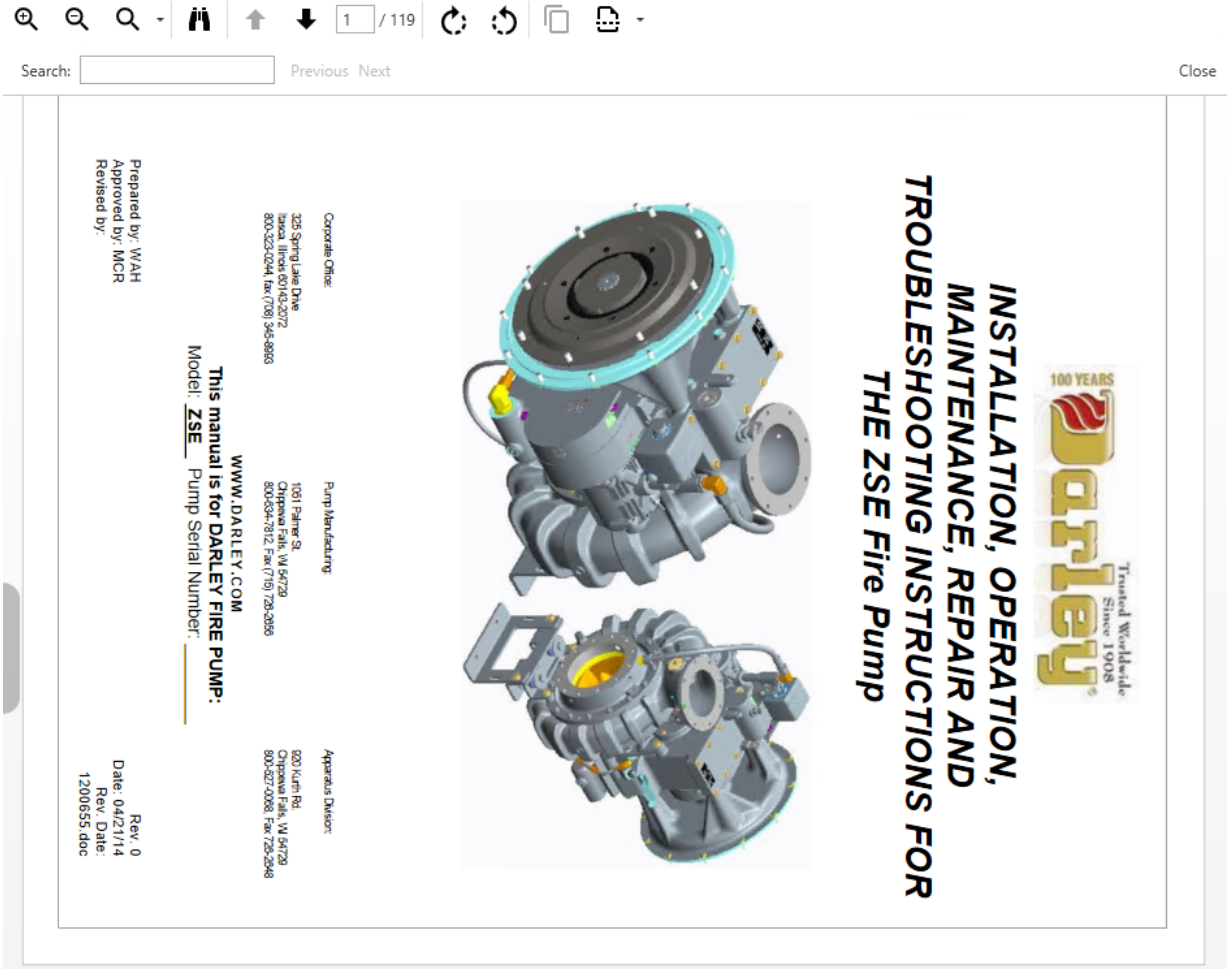
The PDFViewerApp includes a set of controls to change the orientation of a PDF document while it is being displayed in preview mode or while the ViewApp is running.



A document can be rotated in 90 degree clockwise or counterclockwise increments each time an orientation control is selected.

Users can also use keyboard shortcuts to rotate clockwise or counterclockwise

- 90 degree clockwise rotation: Ctrl + Shift + OemPlus
- 90 degree counterclockwise rotation: Ctrl + Shift + OemMinus




© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Copy and Paste Content From a PDF Document

Users can copy selected text or graphics from an open PDF document and paste it into another open application like WordPad or Word. using the **Ctrl + V** keyboard shortcut.

**Important**: Graphics and text from a PDF document must be copied separately.

### To copy a graphic from a PDF document

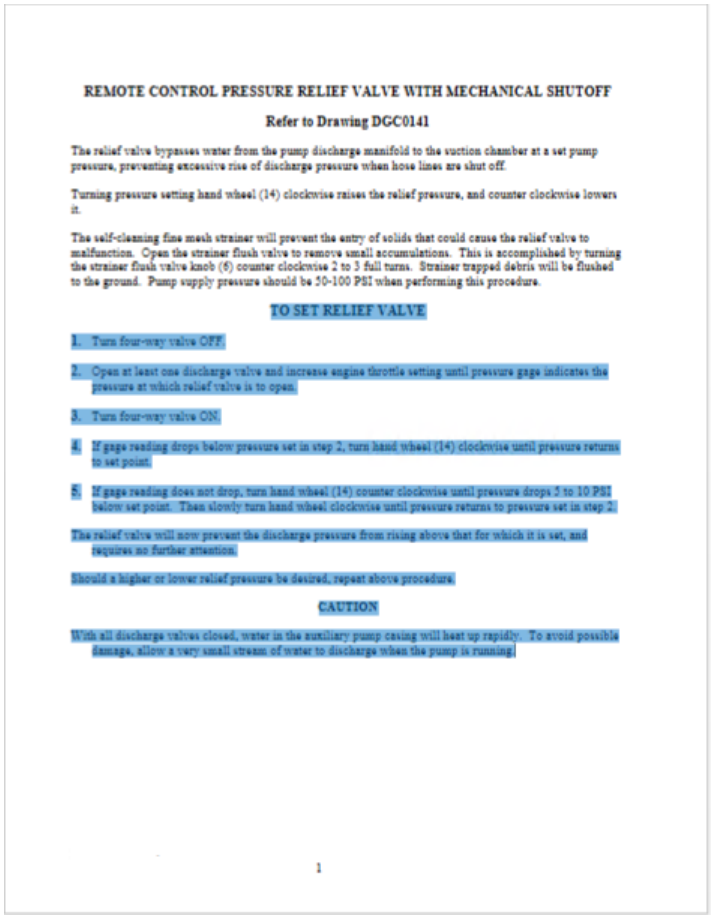
1. Open an application like Word or WordPad to paste content from the PDF document open in the PDFViewerApp.
2. Select the graphic that you want to copy from the PDF document.

   Blue highlighting appears around the graphic to indicate that it is selected.
3. Select the **Copy** control from the PDFViewerApp.
4. Select the area within the open application to paste the graphic.
5. Press Ctrl + V to paste the graphic into the open application.

### To copy text from a PDF document

1. Select the text to be copied by pressing the left mouse key and moving it over the portion of the page containing the text to be copied.

   The selected text appears with blue highlighting to indicate that it has been selected.



REMOTE CONTROL PRESSURE RELIEF VALVE WITH MECHANICAL SHUTOFF

Refer to Drawing DGC0141

The relief valve bypasses water from the pump discharge manifold to the suction chamber at a set pump pressure, preventing excessive rise of discharge pressure when hose lines are shut off.

Turning pressure setting hand wheel (14) clockwise raises the relief pressure, and counter clockwise lowers it.

The self-cleaning fine mesh strainer will prevent the entry of solids that could cause the relief valve to malfunction. Open the strainer flush valve to remove small accumulations. This is accomplished by turning the strainer flush valve knob (6) counter clockwise 2 to 3 full turns. Strainer trapped debris will be flushed to the ground. Pump supply pressure should be 50-100 PSI when performing this procedure.

TO SET RELIEF VALVE

1. Turn four-way valve OFF.
2. Open at least one discharge valve and increase engine throttle setting until pressure gage indicates the pressure at which relief valve is to open.
3. Turn four-way valve ON.
4. If gage reading drops below pressure set in step 2, turn hand wheel (14) clockwise until pressure returns to set point.
5. If gage reading does not drop, turn hand wheel (14) counter clockwise until pressure drops 5 to 10 PSI below set point. Then slowly turn hand wheel clockwise until pressure returns to pressure set in step 2.

The relief valve will now prevent the discharge pressure from rising above that for which it is set, and requires no further attention.

Should a higher or lower relief pressure be desired, repeat above procedure.

CAUTION

With all discharge valves closed, water in the auxiliary pump casing will heat up rapidly. To avoid possible damage, allow a very small stream of water to discharge when the pump is running.

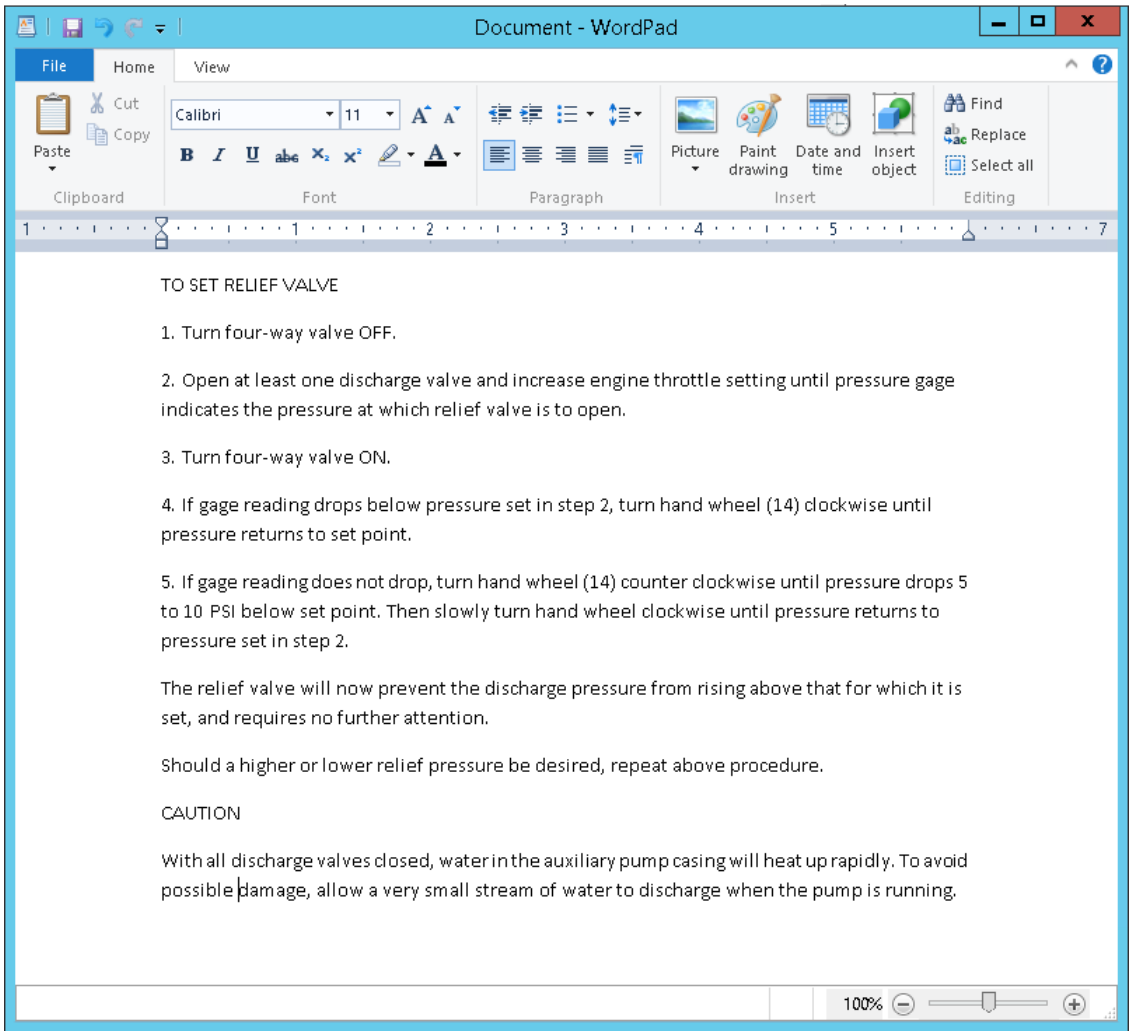
1

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

2. Select the **Copy** icon above the open page or using the copy keyboard shortcut (Ctrl + C).



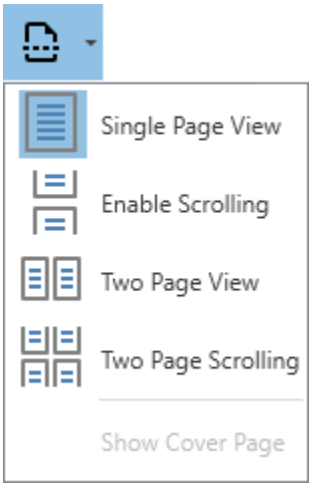
3. Open the application that the copied text will be pasted to and use the Ctrl + V keyboard shortcut to paste the text.



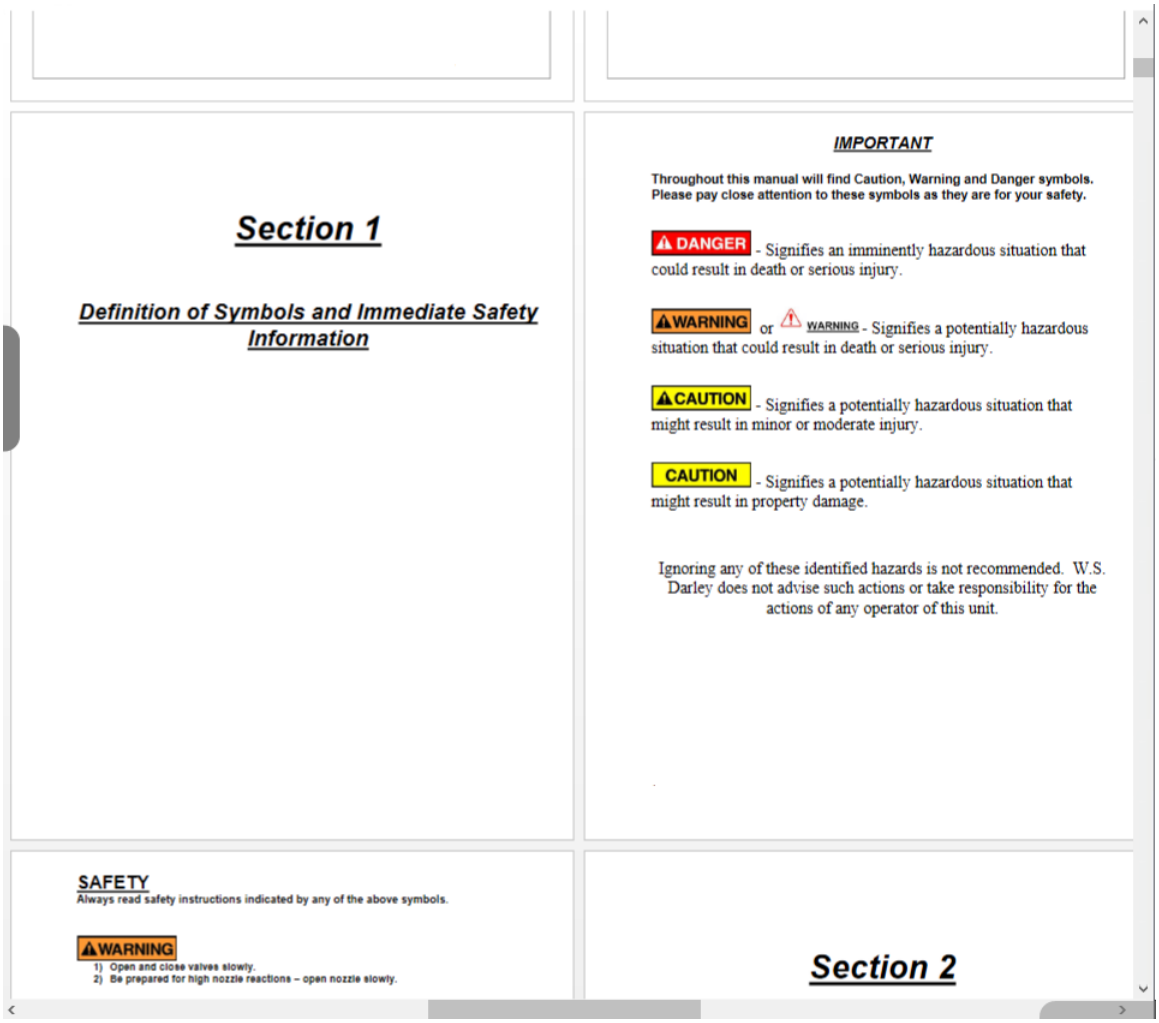

## Change the Page View of a PDF Document

The PDFViewerApp includes a **Page Display** control to set the view of pages within a PDF document and the type of scrolling. The default is a single page view with scrolling.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




Other options include a two page view with two page scrolling.




## Touch Support

The PDFViewerApp supports single finger gestures on touch screens or portable devices.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- A PDF document can be swiped or flicked vertically to show the previous or next pages of a document.
- A single finger tap can be used to select the visual icons shown on the menu bar of the PDFViewerApp.

See Optimize the PDFViewerApp for a Touch Device for instructions to enlarge the size of the visual icons to make it easier to select them while using touch gestures.

## Optimize the PDFViewerApp for a Touch Device

The visual icons shown within the viewer window of the PDFViewerApp can be enlarged to make them easier to select on touch screens or portable devices.

The following screen captures show the default size of the PDFViewerApp's visual icons and their size after they have been enlarged for touch. AVEVA OMI includes the OptimizeForTouch Boolean attribute that belongs to the MyViewApp.Settings namespace. The default value of OptimizeForTouch is false. When OptimizeForTouch is set to true, the size of the visual icons is enlarged.

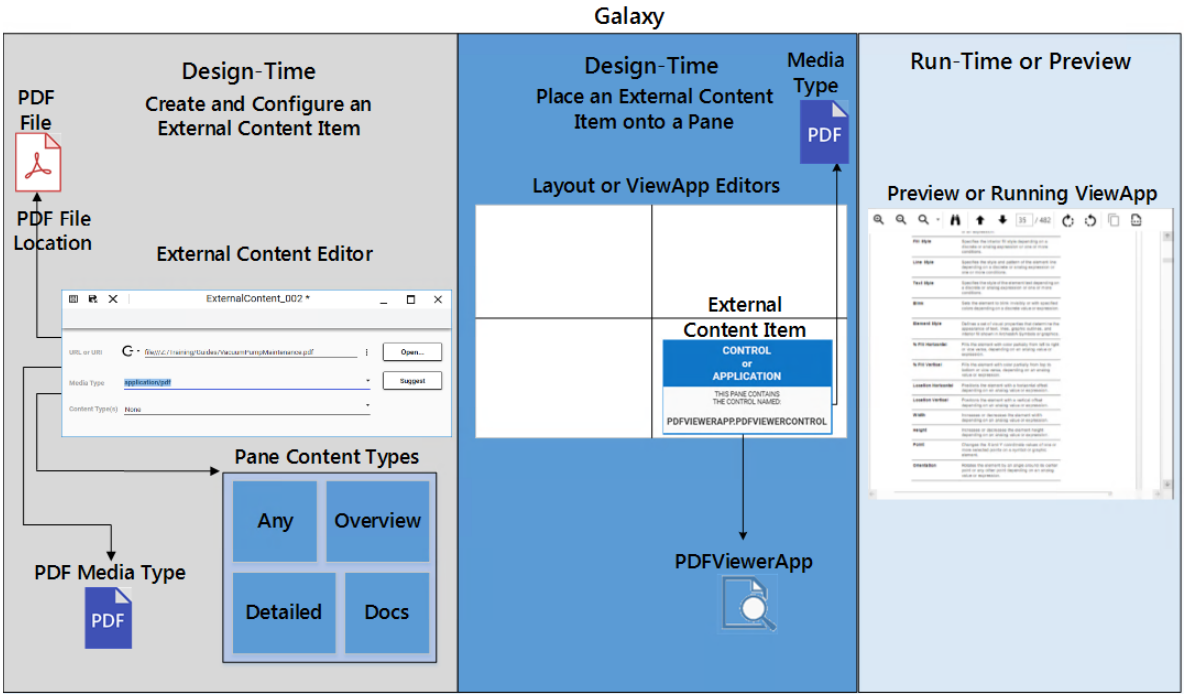
| **OptimizeForTouch Attribute Value** | **Example Icons** |
|---|---|
| MyViewApp.Settings.OptimizeForTouch= False | Regular Size (Non-Touch)  |
| MyViewApp.Settings.OptimizeForTouch= True | Optimized for Touch  |

A common way to dynamically adjust the size of the visual icons in a running ViewApp is to place a graphic element like a button on a pane and then associate user input animation to toggle the state of the OptimizeForTouch attribute.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Configure the PDFViewerApp

The following figure summarizes using an External Content item to point to a folder location containing a PDF document that explains how to perform maintenance on a pump. An External Content item is configured during design time to identify the location of the PDF document and its media type. The External Content item is associated with an asset or a user defined object. The asset or object is selected from the **Toolbox** tab and placed onto a layout pane. During runtime, the user selects an asset associated with a navigation item to view training procedures described in the PDF document.




The major steps to implement the PDFViewerApp to show PDF documents in a ViewApp are summarized in the following list:

1. Place a PDF document on a computer accessible from your Galaxy.
2. Create an External Content item.
3. Configure the External Content item that identifies the location and media type of the PDF document.
4. Associate an External Content item to a graphic or object.
5. Place an asset or graphic on a ViewApp pane associated with the External Content item.

## Before You Begin

Before starting the steps to configure an External Content item, ensure the following prerequisites have been met:

- If you are placing the PDF document on a remote computer in your network, ensure connectivity between the computer where the ViewApp will run and the computer where the remote PDF document has been saved.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

Mapping a network drive is a typical way to connect to a remote computer hosting documents that you want show in a running ViewApp. For this configuration to work successfully, it is important that the computer to which the ViewApp is launched from has the same drive letter mapped to a location having the referenced document.

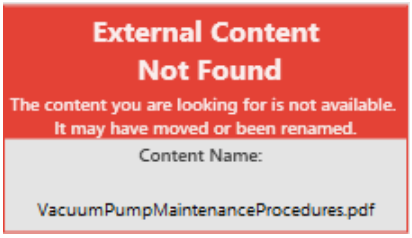
The PDFViewerApp shows an error message to the user if the specified URI connection to the PDF file is bad. For more information about the error message, see PDFViewerApp Error Message.

- Save the PDF document in the presentation format that you want to display in the DocViewApp.

  Typically, you want to format the PDF document in its intended final form without showing any revision markup.

### PDFViewerApp Error Message

An External Content item includes an **URL or URI** option to specify the location of the PDF file to be shown by the PDFViewerApp during runtime or in preview mode. The specified location of the file must be complete and accurate. If the file is moved, deleted, or renamed, the PDFViewerApp shows an error message to the user during runtime, but the ViewApp continues to run.




## Create an External Content Item

You create an External Content item from the Visualization folder of the System Platform IDE. Initially, the External Content item defaults to a set of values that can be changed using the External Content editor.

### To create an External Content item

1. Open the IDE and select the **Visualization** tab.
2. Select a folder within the **Visualization** folder if you want to create a new External Content item at a specific location.
3. On the **Home** ribbon, in the **Create** area, select **External content**.

   You can also create an External Content item by other methods:

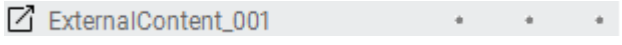
   - **Keyboard Shortcut**

     Press Ctrl + Shift + C

   - **Shortcut Menu**

     Right-click a folder of the **Visualization** folder to show a shortcut menu. Select the **New** option, and then select **External Content**.

   A new **External Content** item is created in the **Visualization** folder**.**




© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

The name of the new item follows a default naming convention of appending a three-digit number to the word ExternalContent.

4. Rename the External Content item.

After you create an External Content item, it must be configured to specify the remote location of the content and its media type.

## Configure the External Content Item for a PDF Document

Each External Content item has three properties that must be assigned values:

- **URL or URI**
- **Media Type**
- **Content Type(s)**

An External Content item is modified from the External Content editor. The editor can be opened by double-clicking an item from the Visualization folder. Also, an External Content item that has been placed onto a layout pane can be edited from the Layout and ViewApp editors by the selecting the item from the Actions list.

### To configure an External Content Item

1. Open the IDE and select the **Visualization** tab to show the External Content items available in the Galaxy.
2. Double click an External Content item to open within the External Content editor.

   For more information about each field in an External Content item, see Details of the External Content Editor.
3. Enter a URI string or web site URL in the **URL or URI** field where the document is saved.

   The value you enter is the location of the external content specified by a URI-formatted string. A media location must be specified.

   You can browse for the document file by selecting the vertical dots icon to the right of the data entry field. A drop-down list includes a **Browse for file** option that enables you to browse your network and select a media file. The **URL or URI** field updates and shows a formatted URI path to the file.

   You can also enter a URL to a web site by selecting the **http://** or **https://** options from the drop-down list. The **http://** and **https://** options assist the user when entering URLs by prefixing the URLs with the selection.

   See More Information About Specifying a URI, More Information About Specifying a URI, More Information About Specifying a URI, More Information About Specifying a URI for information about the format of a URI string.
4. Select the **Open** button to validate the URI or URL you entered.

   The **Open** button launches the appropriate application associated with a pdf file type, which is usually Adobe Reader to display the document specified in the **URL or URI** field.
5. Select the type of media associated with documents from the drop-down list of the **Media Type** field.

   The value you enter is the MIME type of a PDF document. The PDF MIME type provided by the PDFViewerApp is:

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

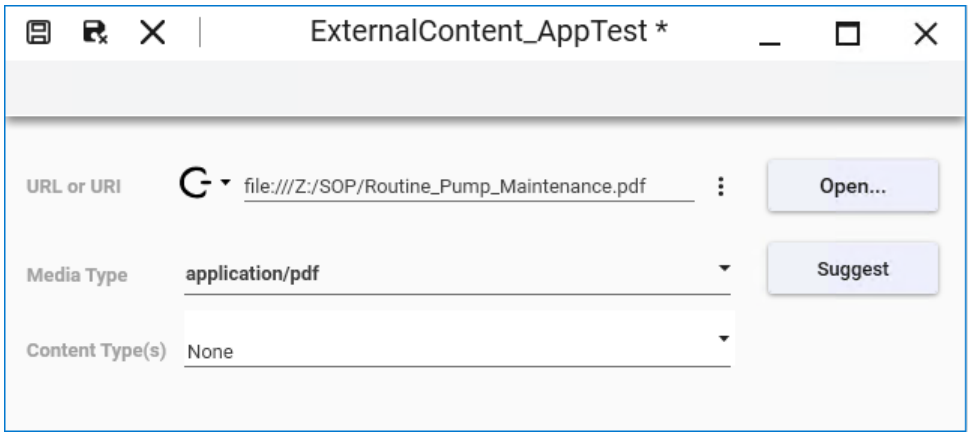
**application/pdf**

See More Information About Media Types, More Information About Media Types, More Information About Media Types, More Information About Media Types for more information about supported media types.

6. Select the type of content from the drop-down list of the **Content Type(s)** field.

   The value you enter is used by content-placement algorithms within AVEVA OMI during run time to determine the placement of content when AutoFill or ShowContent calls are invoked.

7. The configured External Content item for a PDF document should look like the following screen capture.




8. Save your changes and exit from the External Content item.

## Link an External Content Item to an Object or Template

There are three ways to integrate an External Content in a ViewApp.

- Associate an External Content item to an object template, which is described in the following procedure
- Associate an External Content item to a custom navigation item that appears in the navigation model of the ViewApp.
- Place the External Content item on a layout pane, which is the simplest way and is described in Associate an External Content Item to a ViewApp.

### To link an External Content item to an object template

After you have created and configured an External Content item, you can link it to an object template. External Content items can be linked only to objects as opposed to graphics, which can be linked to or owned by an object. All External Content items reside in the Visualization folder. A single External Content item can be linked to multiple objects.

1. Open an object template in the **Object Editor**.
2. Select the **Attributes** tab.
3. In the **Content** pane, select the **Link Content** button.

   The Galaxy Browser opens.

4. Navigate to the folder that contains the **External Content** item to be linked.
5. Select the item, then click **OK**.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

The item is added to the object and appears in the **Content** tab.

**Note:** After linking an External Content item, you can modify it by selecting it and then pressing the **Edit** button. However, any changes you make will apply to all objects that link to the item.

6. Save your editing changes to the object template and exit from the Object Editor.
7. Create an instance of the of the linked object template.
8. Create a layout which contains pane with a Content Type that matches the content type of the External Content item.
9. Add a navigation tree to the layout
10. Create a ViewApp that incorporates the layout.
11. Deploy the ViewApp.

    In runtime, navigate to the object or any instance created from the template. External Content item will auto-fill the matching pane to show the external content.

## Associate an External Content Item to a ViewApp

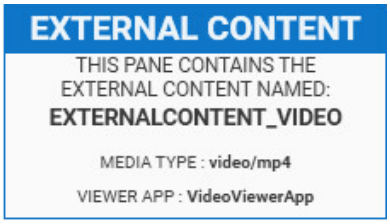
You can place an External Content item directly onto a pane from either the Layout or ViewApp editors . External Content items are listed in the **Toolbox** or **Assets** tabs of either editor.

**To associate external content to a ViewApp**

1. Open the System Platform IDE and select the **Visualization** tab to see the list of layouts.
2. Select a layout that you want to insert external content and open it in the Layout editor.
3. Select the **Toolbox** tab of the Layout editor to show the list of content accessible from the Galaxy.
4. Locate the External Content item you want to place in the layout you selected.

   External Content thumbnails appear beneath of the list of content shown in the **Toolbox** list.
5. Select an External Content thumbnail from the **Toolbox** area, and then drag and drop it onto a pane of a layout incorporated into a ViewApp.

   The External Content thumbnail appears in the pane containing the name of the External Content item, the media type of the external content, and the viewer app that will display the media during runtime. Also, the layout **Actions** area shows the name of the External Content item and the pane that it was placed in.




# Editing an External Content Item After Being Placed onto a Pane

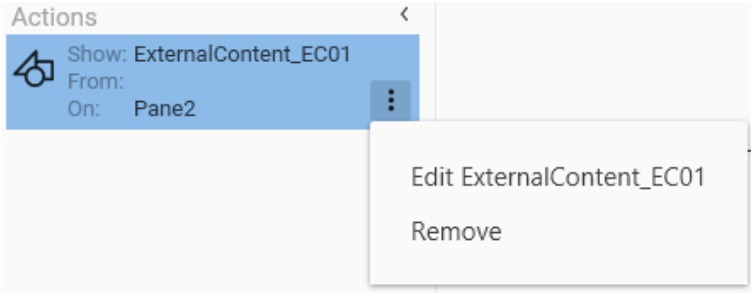
An External Content item can be modified after being placed in a layout or a ViewApp, which automatically propagates the changes

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### To edit an External Content item in a layout

1. If necessary, open the layout containing an External Content item.
2. Locate the item in the layout **Actions** list.
3. Select the **Options** icon shown at the right of the item in the **Actions** list.

   A drop-down list shows an Edit External Content command.




4. Select the **Edit** command.

   The External Content editor opens the item for editing.
5. Update the values assigned to the item and save your changes.

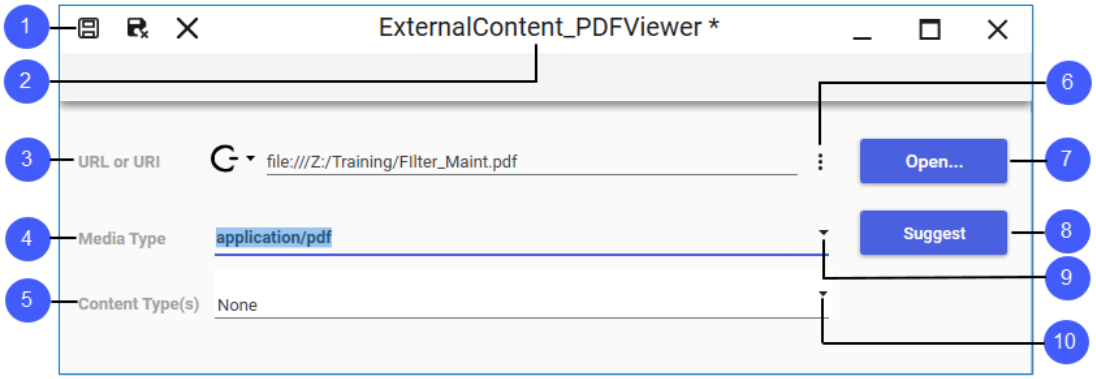
   The External Content thumbnail placed in a pane updates to reflect the changes made to the item.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Details of the External Content Editor

You use the External Content editor to configure an External Content item for a document. Before you configure an External Content item, you must know:

- Network location of a document
- Media type of the document
- Content type(s) of the layout pane that will host the External Content item




| | |
|---|---|
| 1 | Commands to save, save and close, and close the External Content editor. |
| 2 | Name of the External Content item. |
| 3 | URL or URI that specifies the location of external media using a standard format. See More Information About Specifying a URL or URI for the format of a URI or URL<br>A warning message appears if the document cannot be located during runtime. |
| 4 | A media type is a two-part identifier that specifies the type of application required to process or view remote content. A media type can be entered in the field or selected from a drop-down list. See More Information About Specifying a MediaType for the format of a Media type value.<br>A warning message appears if a media type is specified that does not have an associated viewer application. |
| 5 | Content type assigned to the external media that enables ViewApp algorithms to place content in specific panes during runtime. |
| 6 | Drop-down list with options to browse for an external content file or specify a URL using HTTP or HTTPs. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| 7 | Validates the location of external media specified in the **URL or URI** field. An attempt is made to display the external media in an application assigned as the default by the operating system, not the app specified for the external content media type.<br>A warning message appears if the content cannot be found at the location specified in the **URL or URI** field. |
| 8 | **Suggest** is optional. When selected, it automatically selects a media type based on the entry in the **URL or URI** field. The entered value can be changed if the suggestion does not match the expected media type.<br>**Note**: Ensure the suggested media type is correct. The external media does not appear if the media type is incorrect. |
| 9 | Drop-down list of commonly used media types. Media types that have apps in the Galaxy capable of servicing them are shown in bold text. |
| 10 | Drop-down list of content types that can be used at preview\runtime to assign the external content to panes of a matching content type.<br>**Note**: None is not a content type. Instead, it simply means a content type has not been assigned to the pane. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

## More Information About Media Types

A media type is a standard two-part string analogous to a MIME type that identifies external content file types and their format. System Platform uses a media type to identify external content and the type of app required to display media during runtime.

A media type consists of a type and a subtype, which is further structured into a tree.

type "/" [tree "."] subtype ["+" suffix] *[";" parameter]

For more information about the format of media types, see https://www.iana.org/assignments/media-types/media-types.xhtml

System Platform provides several default media types that include associated apps to display media. The drop-down list of the **Media Type** field shows the default media types in bold text to indicate a viewer app is available in the Galaxy that can service external content with these media types. Other listed media types that appear in plain text require an app to be created and imported into a Galaxy to play the specified media.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# More Information About Specifying a URI

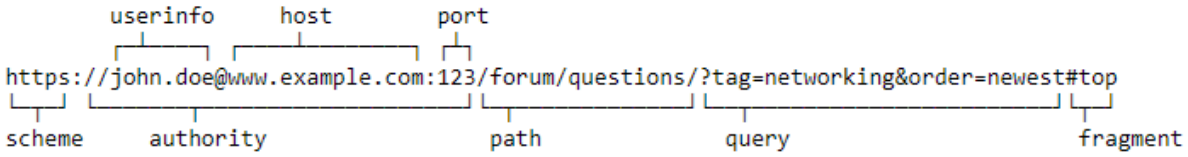
In the context of External Content, a Uniform Resource Identifier (URI) is a string that identifies the pathway to specific content that can appear in a running ViewApp.

All URIs adhere to predefined syntax rules.

- Generic URI syntax consists of a hierarchical sequence of components

  ```
  URI = scheme:[//authority]path[?query][#fragment]
  ```

  **Example**

- Each URI begins with a scheme name followed by a colon

  Examples of common scheme names include http:, https:, and file:

- An optional authority component preceded by two slashes (//)
  - Use information component consisting of a user name and optional password preceded by a colon followed by an at symbol (@)

    //username:password@

  - Host subcomponent consisting of a registered hostname or IP address
- A path component consisting of a sequence of path segments separated by a slash (/). A path is always defined for a URI, though the defined path may be empty
- An optional query component preceded by a question mark (?), containing a query string of non-hierarchical data.

For more information about the format of a URI, see https://tools.ietf.org/html/rfc3986

The following examples show common URIs that identify External Content within a Galaxy

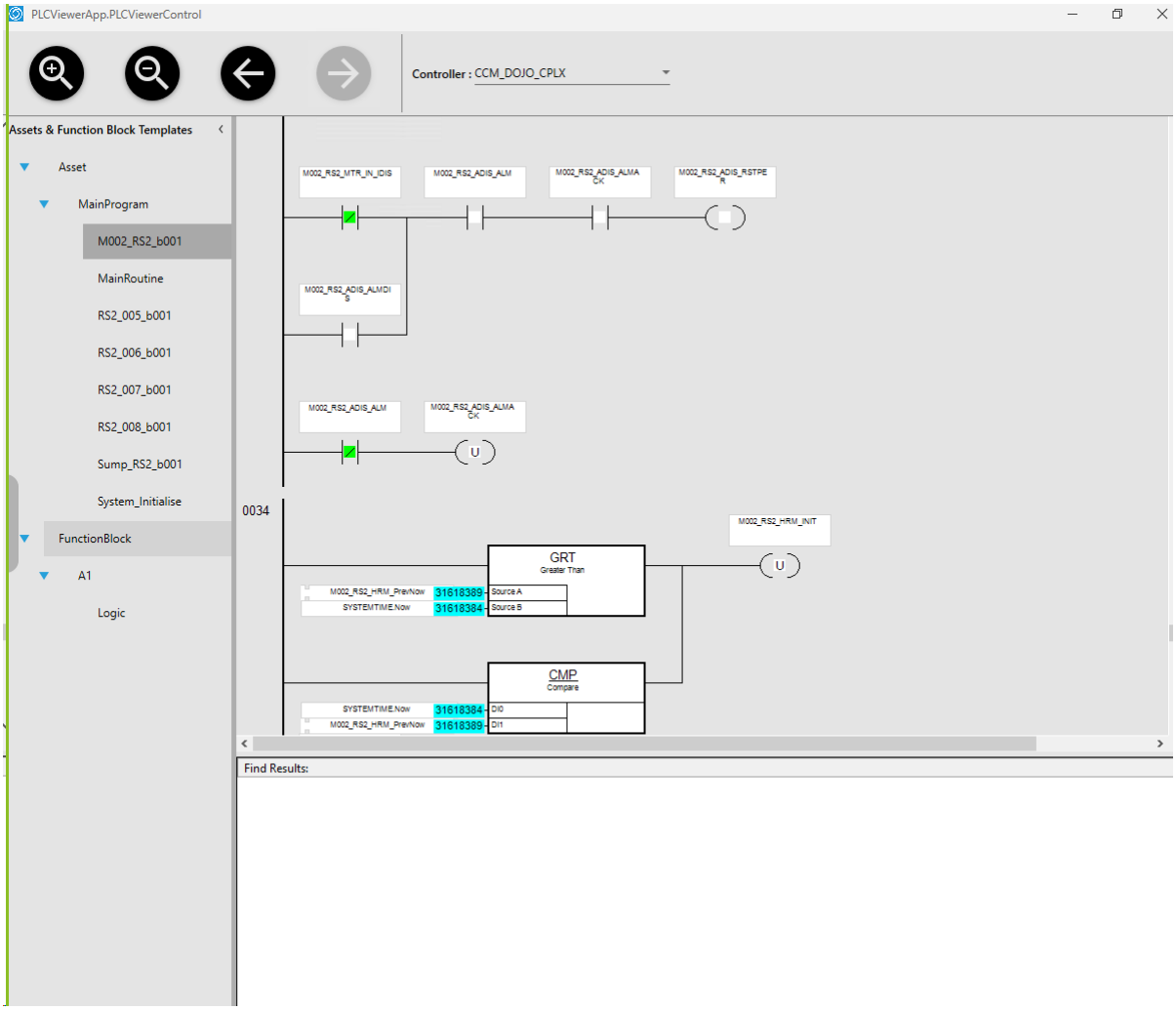
- ftp://ftp.is.co.za/rfc/rfc1808.txt -- ftp scheme for File Transfer Protocol services
- file:///Z:/Media/Runtime%20Language%20Switching.mp4
- http://www.exampleserver.com/documents/index.html

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Chapter 10 AVEVA PLC Viewer OMI App Introduction

While an InTouch OMI ViewApp is running, the AVEVA™ PLC Viewer OMI App shows a current asset's PLC control logic with real-time logic animation. Hereafter, the AVEVA™ PLC Viewer OMI App is referred to as the PLC Viewer App.

The PLC Viewer App provides a view within a layout pane to easily identify the current control states of a PLC. In the following example, current values associated with a function block have a blue background. Function blocks are annotated with descriptive comments that appear when hovering the mouse cursor directly over a function block shown in th app view.




The PLC Viewer App shows a three-pane window. The left navigation pane shows a vertical list of controller components by assets and function blocks. Users select an item from the component list to show its details in the right pane. The detail pane includes scroll bars to move the view horizontally and vertically. Controls are included to zoom the view in or out. The **Find Results** pane shows the results of a search.

Users can switch the view by selecting another controller from the **Controller** field shown above the two PLC Viewer App panes. The **Scope** field appears when selecting add-on instructions to enable selecting a specific instance to animate.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# PLC Viewer App Requirements

You should have already imported the PLC Viewer App to your computer hosting the Galaxy Repository. Refer to the *AVEVA PLC Viewer OMI App Readme* for instructions to import the app.

This version of the PLC Viewer App must adhere to the following requirements:

- The PLC Viewer App is targeted for System Platform 2017 Update 3 Service Pack 1 and later.

  This version of the PLC Viewer App can be upgraded to subsequent versions of System Platform when they become available.

- This version of the PLC Viewer App supports Rockwell, Schneider Electric, and Siemens Step7 PLCs.
- The PLC Viewer App requires controller project data from a source logic file, which can be created by each PLC vendor's software utilities.A logic file contains the following data referenced by the PLC Viewer App:
  - Ladder programs
  - Controller and program tags
  - Add-on instructions
  - User function blocks
  - I/O tags
  - User defined data types

  For Siemens Step7 PLCs, an export utility application has been provided to export the project configuration into a portable file for each CPU using the Siemens API.

### Rockwell RSLogix 5000-compatible products

PLCs compatible with the Rockwell RSLogix 5000 family of products require a logic file that must be exported as a .L5X file.

A RSLogix source file is an ASCII file whose data is formatted using Extensible Markup Language (XML). A logic file contains exported controller configuration information and ladder logic of a controller project. You must use your RSLogix-compatible software to export a L5X source logic file.

### Schneider Electric Unity Pro-compatible products

Controllers compatible with the Schneider-Electric Unity Pro family of products require a logic file that must be exported as a .zef file. This version of the PLC Viewer App supports Unity Pro 11 to the latest version known as EcoStruxure™ Control Expert.

*.ZEF files are used for exporting projects with global DTMs configuration and are compatible with all versions of Unity Pro.

You must place the source logic file in a folder accessible to the computer hosting the System Platform IDE. Unity Pro needs to be installed on the PC where the PLC Viewer App is configured to access Unity Pro library files. The PLC Viewer App only accesses the XML files included by the installer and does not require the application to be licensed.

**Note**: If Unity Pro is not installed, a browser dialog appears to enable sourcing the Unity FBLIBSET folder from a user specified location.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- When using context following with the PLC Viewer App, you can optionally create an asset mapping file to alias the context string to a PLC tag and set the context to a specific controller in a comma separated value (CSV) file.

  You must place the asset mapping file in a folder accessible to the computer hosting the System Platform IDE.

  For more information about an asset mapping file, see Create an Asset Mapping File.

### Siemens Step7-compatible products

Projects configured using Siemens Step7 must be exported using the PLCViewerAppExporter provided with the package. The PLCViewerAppExporter uses the Siemens Step7 API to export each Stations to an encrypted file. You must place this file in a folder accessible to the computer hosting the System Platform IDE

**To export a Siemens project:**

1. Copy the PLCViewerAppExporter folder containing the PLCViewerAppExporter.exe and ArchestrA.Prometheus2.Shared.dll to the computer where Siemens SIMATIC Manager is installed and licensed.
2. Confirm the project is accessible in SIMATIC Manager
3. Export SFC source if the source is not current
4. Close SIMATIC Manager
5. Open PLCViewerAppExporter.exe
6. Select the Controllers to export
7. Override the Block and Symbolic name by entering a Display Name (optional)
8. Select File – Import – Display names (*.csv) to load previously saved Display Names (optional)
9. Select File – Export – Display names (*.csv) to save overridden Display Names (optional)
10. Select File – Export – Project (*.S7X) to export controllers to disk
11. Check Exclude unreferenced programs to include programs not being executed (optional)
12. Select OK
13. Select the folder location to save the controller export files

**NOTE**: Siemens GRAPH (SFC) source files may require updating manually using SIMATIC Manager to ensure the logic presented in the PLCViewerApp is up to date. A message will appear in the output window for each GRAPH file that requires manual export.

When using context following with the PLC Viewer App, you can optionally create an asset mapping file to alias the context string to a PLC tag and set the context to a specific controller in a comma separated value (CSV) file.

You must place the asset mapping file in a folder accessible to the computer hosting the System Platform IDE.

For more information about an asset mapping file, see Create an Asset Mapping File.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# PLC Viewer App Configuration

This chapter describes how to configure the PLC Viewer App after it has been imported to a computer hosting a Galaxy Repository on a supported version of System Platform. Refer to the *AVEVA PLC Viewer OMI App Readme* for instructions to import the PLC Viewer App.

Configuring the PLC Viewer App consists of two separate workflows.

- Configure PLC Data Sources

  Configuring PLC data sources is required and must be completed before configuring PLC Viewer App properties. You must have a source logic file and an asset mapping file ready.

- Configure PLC Viewer App Control Properties

  PLC Viewer App properties specify the default runtime behavior and visual color scheme of the app. These properties have been assigned default values that can be accepted without making any changes.

## Required and Optional Information

Before you configure the PLC Viewer App, you must gather information about the PLC environment whose code execution you want to monitor while running a ViewApp.

- You are expected to be knowledgeable about your production environment. You must specify the names of the following components to configure the PLC Viewer App:
  - Communication Driver Object, also known as a DI Object (OPCClient or DDESuiteLink Client)
  - OI Server path
  - Scan group
- Source logic file (Required)

  You must export a Rockwell, Schneider Electric, or Siemens Step7 source logic file (L5X, ZEF, or S7X) that contains data from your PLC environment and place it in a folder location accessible to the computer hosting the System Platform IDE.

- Asset mapping file (Optional)

  The asset mapping file provides alias information for mapping context to a tag name in a specific controller. You can create an optional asset mapping file and place it in a folder location accessible to the computer hosting the System Platform IDE. For instructions to create an asset mapping file, see Create an Asset Mapping File.

- Translation file (Optional)

  The PLC Viewer App includes a default translation file that defines function block layouts for Rockwell 30 ladder functions. If you want to show additional data associated with data structures or add layouts for functions that are not included in the default translation file, you can create an optional translation file and add it to the PLC Viewer App. For instructions to create a custom translation file, see Create a Translation File. For instructions to add a custom translation file to the PLC Viewer App, see Integrate Information from a Custom Translation File.

## Configure PLC Data Sources

You can specify three different files to configure the data sources for the PLC Viewer App:

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

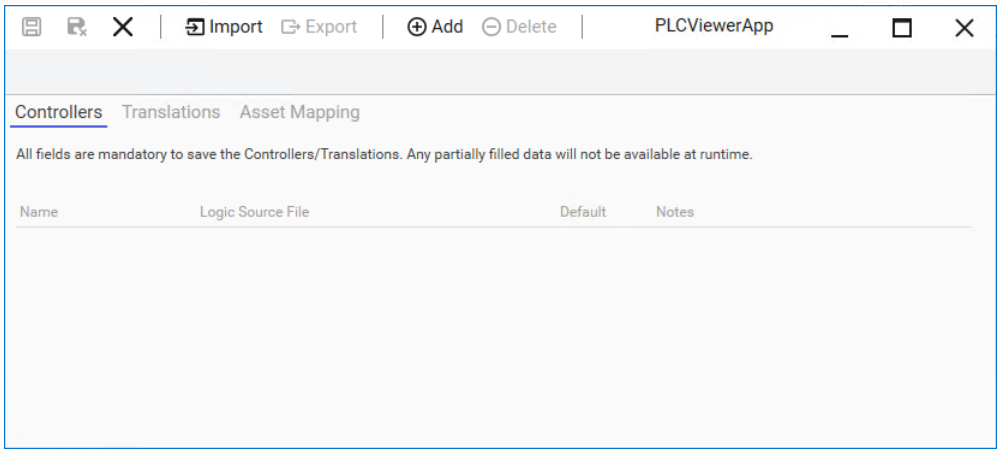
- An RSLogix 5000, Schneider Electric Unity Pro, or Siemens source logic file (Required)
- Translation file (Optional)
- Asset mapping file (Optional)

You must place these files at a known folder location that is accessible to the computer hosting the System Platform IDE.

### To incorporate source data information into the PLC Viewer App

1. Open the System Platform IDE and select the **Graphic Toolbox** tab to show a list of folders containing symbols and apps.
2. Locate the PLC Viewer App control within the **Toolbox.**

   By default, the PLC Viewer App control is placed at the root folder of the Galaxy when it is imported into the System Platform IDE.
3. Double-click the PLC Viewer App control listed in the **Toolbox** view to show the **PLCViewerApp** dialog box.




4. Select the **Controllers** tab.
5. Click **Add** to add a row to the page.
6. To change the controller name, double-click the assigned name, type the new name, and press **Enter**.
7. Select the browse button at the right of the **Logic Source File** field and locate the folder where the source logic file has been saved.
8. Select the source logic file from the folder and click **Open**.

   The **Properties** area of the dialog shows a list of properties.
9. Enter values for the **DI Object**, **OI Server Path**, and **Scan Group** properties.

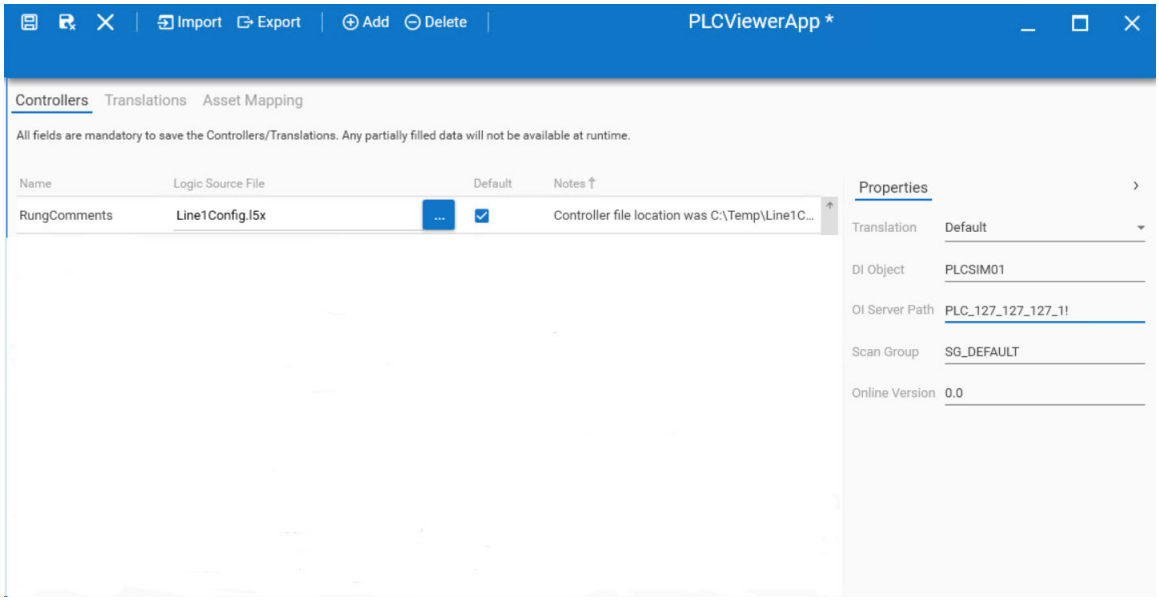
   **Important**: All properties must be assigned values. No property can be left blank.

   - **DI Object:** Name of the DIObject (Communication Driver Object) in the Galaxy configured to communicate to the controller. The DIObject must have a configured Scan Group.
   - **OI Server:** Format specific:
     - DDESuiteLinkClient (Rockwell) – *attribute*()
     - OPCClient OI.ABCIP (Rockwell) – <*Port*>.<*Module*>.<*Backplane*>.<*Processor*>

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- OPCClient Schneider-Aut.OFS (SE) - <*OFS Device Alias*>!
- OPC Client (Siemens Step7) - <*path_to_server*> (For example, POrt.legacy)

- **Scan Group**
  - DDESuiteLinkClient (Rockwell) – <*Device Groups Name*> configured in the OIServer Processor
  - OPCClient Scan Group (Schneider or Siemens Step7)




10. Enter the **Online Version** of your RSLogix or Schneider Electric controller.

    An **Online Version** is entered as a single value as:

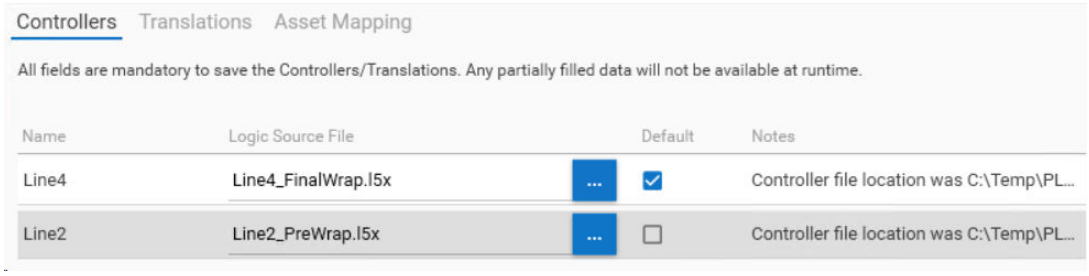
    **RSLogix**: *x.y* (major.minor) For example: 1.01

    **Unity Pro**: *word1.word2* For example: 24754.6346 or %SW94.%SW95

    For more information about checking the online controller version, see PLC Viewer App Runtime Version Check.

    **Note**: The online version is not supported for Siemens controllers. You do not need to enter anything in this field.

11. Repeat steps 2-10 if you want to add information from another logic source file.
12. Select the checkbox beneath the **Default** field for the controller that you want to assign as the default.

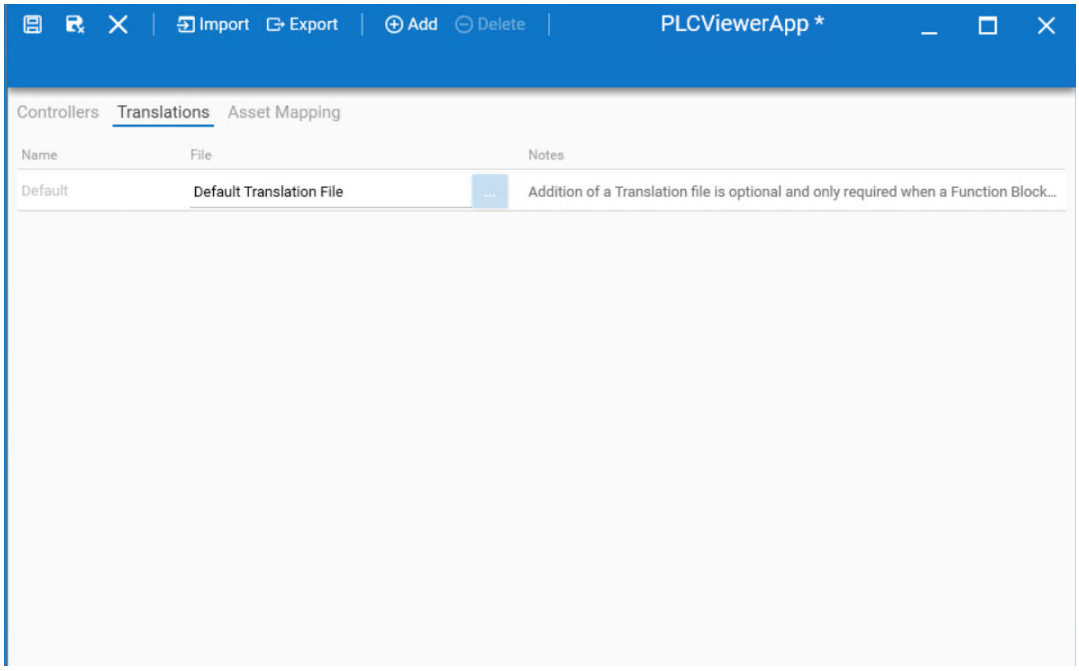



The PLC Viewer App will initially open in runtime showing data from the default controller.

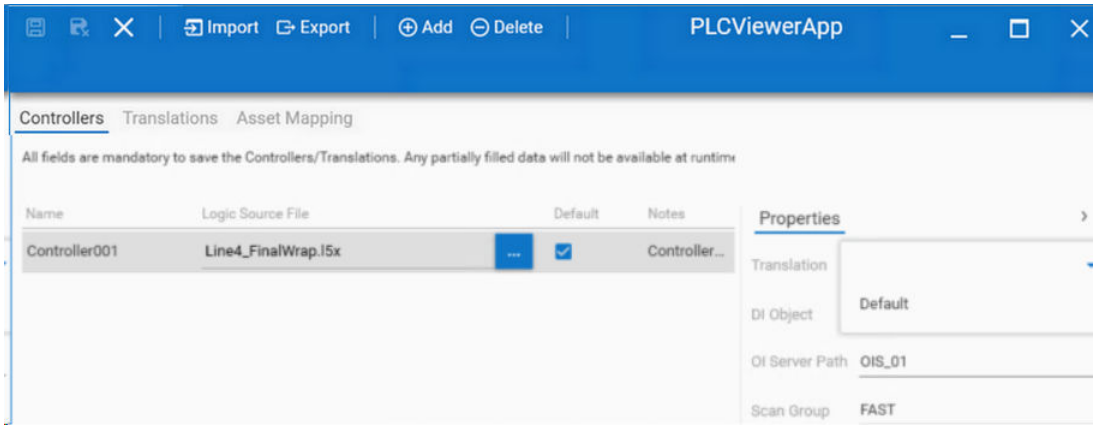
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

13. Select the **Translations** tab.

    A translation file is assigned by default. You can accept the default translation file or add a translation file that has been imported. The rest of this procedure explains how to configure the PLC Viewer App using the default translation file. For the steps to add a translation file, see Create a Translation File.




14. Select the **Controllers** tab and select a controller from the list.
15. Select **Default** from the drop-down list of the **Translation** field.



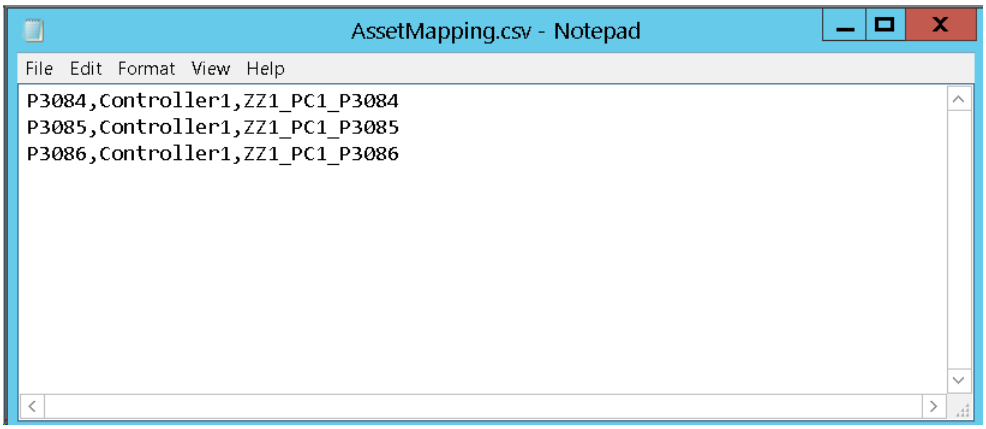

16. Select the **Asset Mapping** tab
17. Select **Add** to add a row to the page
18. Select the browse button at the right of the **File** field and locate the folder containing the asset mapping file.
19. Select the asset mapping file and click **Open**.
20. Save your changes and close the dialog box.

Proceed to Configure PLC Viewer App Control Properties to complete the remaining configuration tasks.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

## Create an Asset Mapping File

An asset mapping file is a comma separated value file with a .CSV file extension that can be created with Excel, Notepad, or other text editors.




An asset mapping file contains a list of AVEVA assets that represent physical objects like a pump or a valve in your production environment that are monitored and managed by a running ViewApp. Each listed asset includes the controller that manages data from the asset and an asset identifier of data collected from the asset.

An asset mapping file enables you to map an AVEVA asset name to a PLC tag name in a specific controller. For example, you have an asset Pump001 and your PLC environment contains multiple controllers with the tag PMP001. You can add a map for Pump001 that searches controller PLC01 for the tag PMP001 using the following line in the mapping csv:

```
Pump001,PLC01,PMP001
```

After you create an asset mapping file, you need to place the file in a folder location that is accessible to the computer hosting the System Platform IDE. You specify the asset mapping file while configuring the data sources for the PLC Viewer App described in Configure PLC Data Sources.

## Create a Translation File

A translation file is an XML formatted file associated with the Rockwell Automation RSLogix 5000 ladder logic programming package. The PLC Viewer App includes a default XML translation file that specifies the parameters that appear on a function block for RSLogix v30. If you want to show additional parameters on a function block, support additional versions of RSLogix, or support blocks not included in the default library, you can create a custom translation file.

A quick and simple way to create a custom translation file is to copy the default translation file and modify it to specify additional function block parameters.

### To create a copy of a translation file

1. After importing the PLC Viewer App, locate the default translation file.
   a. Using Windows Explorer on the Galaxy Repository computer, proceed to the following folder:

      C:\Program Files (x86)\ArchestrA\Framework\FileRepository*Galaxy_Name*\ObjectFileStorage2

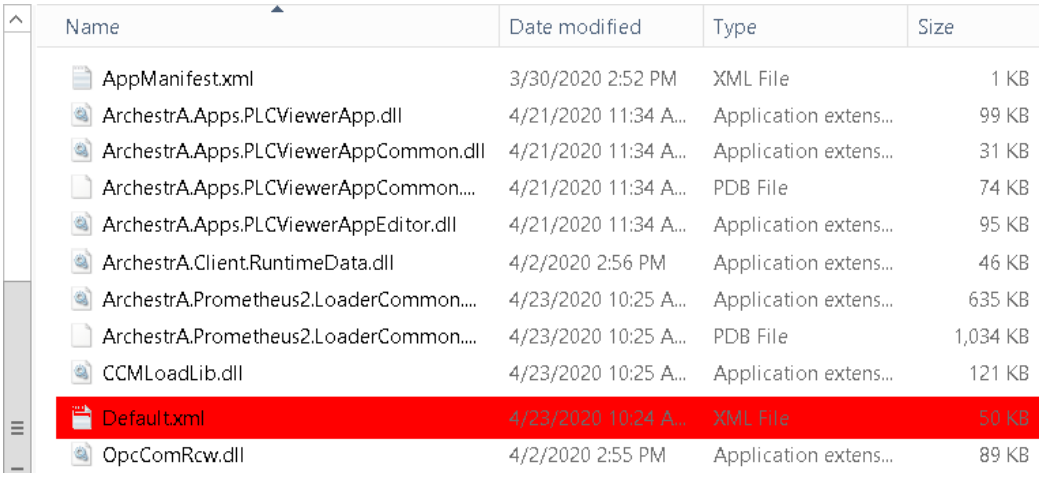
      where *Galaxy_Name* is the assigned name of your Galaxy.
   b. Type `plc` in the search field near the top right of the Windows Explorer window.

      A list of files containing plc in their names appears.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

c. Right-click a listed file to show a shortcut menu and select **Open file location**.

You should see the default translation file listed in the folder.




2. Copy the default translation file and place the copy in an accessible folder.
3. Rename the copy of the default translation file.
4. Modify the copied translation file to access more data from the RSLogix applications.
5. Save your changes.

Continue to Integrate Information from a Custom Translation File for instructions on configuring a custom translation file.

### Integrate Information from a Custom Translation File

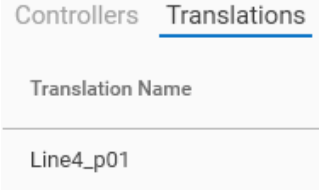
After creating a custom translation file, you need to integrate the data from it into the PLC Viewer App. You follow a procedure similar to accepting the default translation file.

#### To integrate information from a translation file to the PLC Viewer App

1. Place your custom translation file in a folder that is accessible to the computer containing the imported PLC Viewer App.
2. Open the System Platform IDE and select the **Graphic Toolbox** tab to show a list of folders containing symbols and apps.
3. Locate the PLC Viewer App control within the **Toolbox.**

   By default, the PLC Viewer App control is placed at the root folder of the **Toolbox** when it is imported into the System Platform IDE.
4. Select the PLC Viewer App control to show the **PLCViewerApp** dialog box.
5. Select the **Translations** tab
6. Select **Add** to add a row to the **Translations** field.
7. Double-click in the gray area beneath the **Translation Name** column to show a data entry field.
8. Type the name of the translation file.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




9. Click the browser button at the right of the **Translation File** field and locate the folder where the XML translation file has been saved.
10. Select the XML translation file from the folder and click **Open**.
11. Repeat steps 6 through 10 to add other translation files as required.
12. Save your changes.

## Configure PLC Viewer App Control Properties

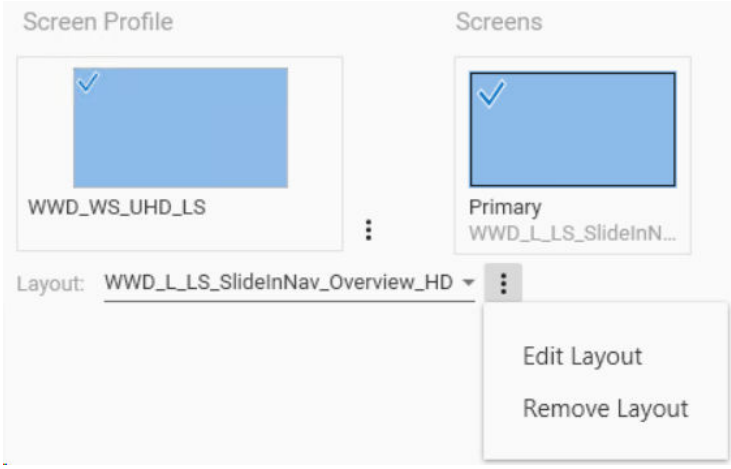
You place the PLC Viewer App into a ViewApp by selecting it from the Toolbox and dragging and dropping it onto a layout pane. After you place the PLC Viewer App on a pane, you can view its properties. Properties are assigned default values that can be modified or accepted without changes.

**Note**: You must configure PLC data sources before placing the PLC Viewer App on a layout pane. See Configure PLC Data Sources

Placing the PLC Viewer App onto a layout pane can be done from the Layout editor or ViewApp editor. The following procedure explains how to integrate the PLC Viewer App into a ViewApp from the Layout editor.

### To configure PLC Viewer App properties

1. From the System Platform IDE, select the **Template Toolbox** tab to show the list of asset templates.
2. Open the ViewApp template instance that you want to place the PLC Viewer App in.
3. From the **Layout** field, open the drop-down list and select **Edit Layout**.




The Layout editor appears with a set of tabs at the right of the editor window.

4. Select the **Toolbox** tab and locate the PLC Viewer App in the list of controls and symbols.

   The default app location in the System Platform IDE is:

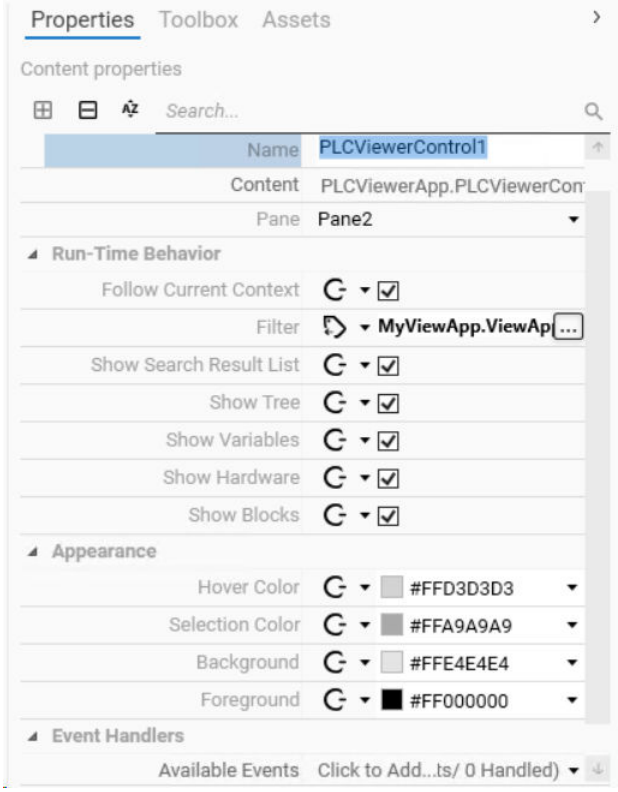
   `Toolbox > _Default Content > 4. Apps > InTouch OMI Apps`

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

5. Select the PLC Viewer App. This displays its thumbnail graphic beneath the **Toolbox** list of controls and symbols.




6. Drag and drop the PLCViewerApp thumbnail onto the desired layout pane.
7. Select the PLCViewerApp thumbnail in the layout pane and select the **Properties** tab to show its properties.




These properties specify the runtime and appearance of the PLC Viewer App while running in a ViewApp. Each property has been assigned a default. You can accept the default or select another value.

The table following this procedure describes the **Run Time Behavior** and **Appearance** properties.

8. Save your changes and close the Layout editor to return to the ViewApp editor.
9. Save your changes and close the ViewApp editor.

| | |
|---|---|
| **Follow Current Context** | Boolean value that determines whether the app view follows the current context of the selected components or not. |
| **Filter** | String, expression, or a regular expression that filter out PLC Viewer App components from the view except those whose asset names match the filter value in the current context. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| **Search Result List** | Boolean value that determines whether the **Find Results** area appears within the PLC Viewer App window or not. |
| **Show Tree** | Boolean value that determines whether the **Assets and Function Block Templates** tree area appears within the PLC Viewer App window or not. |
| **Show Variables** | Boolean value when set to true the **Variables** node appears in the Controller navigation tree to navigate within the **Variables** grid. |
| **Show Hardware** | Boolean value when set to true the **Hardware** node appears in the Controller navigation tree to navigate within the **Hardware** grid. |
| **Show Blocks** | Boolean value when true the **Function Block** node appears in the Controller navigation tree to navigate within **Function Blocks**. |
| **Hover Color** | Background color of a listed item in the **Assets and Function Block Templates** tree in which the mouse is hovering over. |
| **Selection Color** | Background color of a selected item in the **Assets and Function Block Templates** tree. |
| **Background** | Background color of the PLC Viewer App window except the **Find Results** area, which is white. |
| **Foreground** | Font and icon color that appears in the **Assets and Function Block Templates** tree. |

Continue the standard System Platform IDE workflows to place an instance of the ViewApp beneath a ViewEngine or WebViewEngine in the **Deployment** view of the IDE. Then, deploy the ViewApp and its supporting assets.

## PLC Viewer App Runtime Version Check

This version of the PLC Viewer App includes a runtime version check to alert the user when the online program has been modified. During configuration, the user enters the online version values of a controller. These values can be read from the object viewer or by opening the running PLC Viewer App and reading the Online Version error tooltip.

Also, version values can be copied to the clipboard by selecting the Online Version error and right-clicking to show a shortcut menu and selecting the **Copy** command.

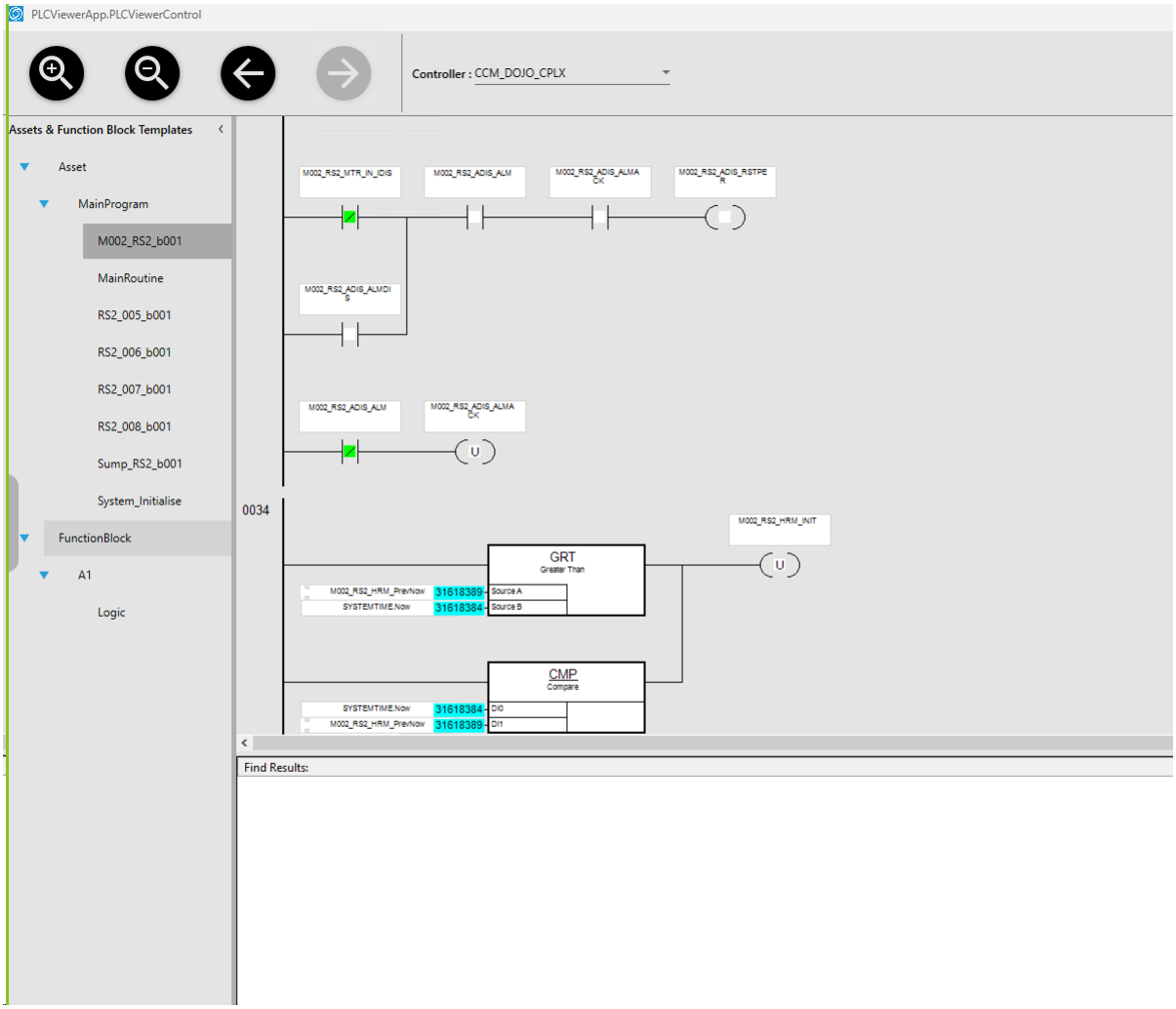
The Rockwell runtime version change detection has some limitations:

- Only online changes to the variable database are detected.
- Setting the online version to “1.0” will not detect changes due to subsequent downloads.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

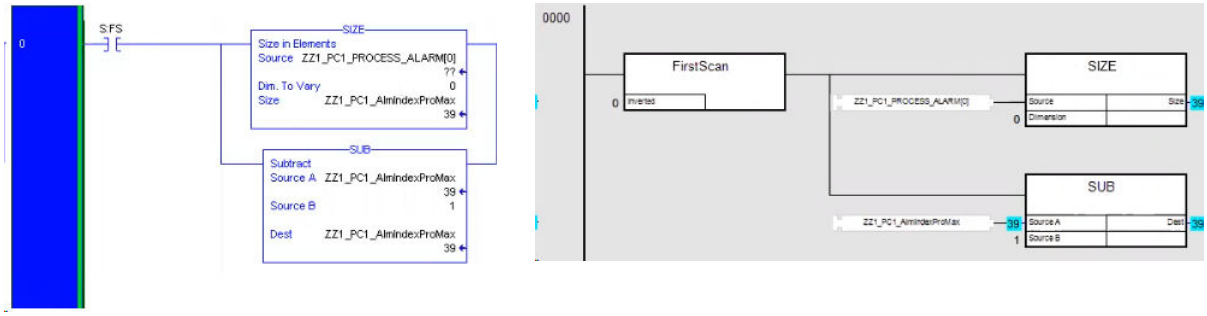
# PLC Viewer App During Runtime

The following figure shows an example of the PLC Viewer App during runtime. The app starts with the default controller assigned during configuration.




The **Assets & Function Block Templates** column at the left shows a hierarchical navigation tree of the controller's Rockwell programs. For example, the figure at the left below shows a Rockwell alarm handler routine. The figure at the right shows the same routine displayed by the PLC Viewer App. The SIZE and SUB function blocks show the same values in both figures. In the PLC Viewer App, current asset values appear next to the function blocks with a blue background.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




- Users select an item listed in the **Assets & Function Block Templates** column to set the context of controller information shown by the PLC Viewer App.

The PLC Viewer App incorporates color animation to identify the current state of data:

- Grey: Binding
- Purple: Bad data
- Cyan: Good data (background color is used to highlight animated values)
- Blue: Private (indicates the data is not accessible to the HMI)

## Runtime Enhancements of the PLC Viewer App

This version of the PLC Viewer App includes a new set of runtime enhancements in addition to the runtime features introduced in Version 1.

### Additional Support for Languages

This version of the PLC Viewer App includes support for the following languages:

- Sequential Function Chart (SFC)
- Function Block Diagrams (FBD)
- Structured Text (ST)

### Variables Tree Grid

This version of the PLC Viewer App shows all controller variables with a check box option. When the check box is selected, the PLC Viewer App displays the current online value of each variable.

### Hardware Tree Grid

This version of the PLC Viewer App incorporates a runtime tree grid that displays the current values of hardware controller racks, modules, and other devices in the network topology.

### DDESuiteLinkClient Support

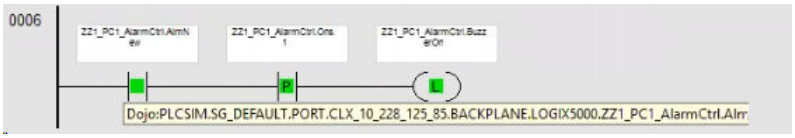
DDESuiteLinkClient support has been added for RSLogix controllers. The IO Server Path has been updated to support the attribute() method to call a tag reference as ".attribute(tagname)".

## See More Information From the PLC Viewer App

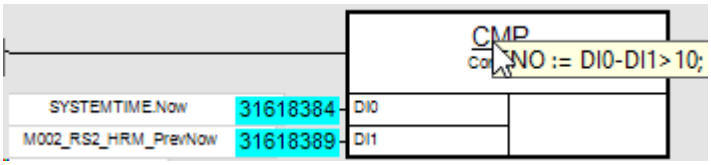
In addition to showing current PLC controller values during runtime, the PLC Viewer App provides other information about the executing Rockwell programs shown in the current view context.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

The PLC Viewer App includes a system of flyover help, which is shown by hovering your mouse directly over a function block to show the asset identifier associated with the block.

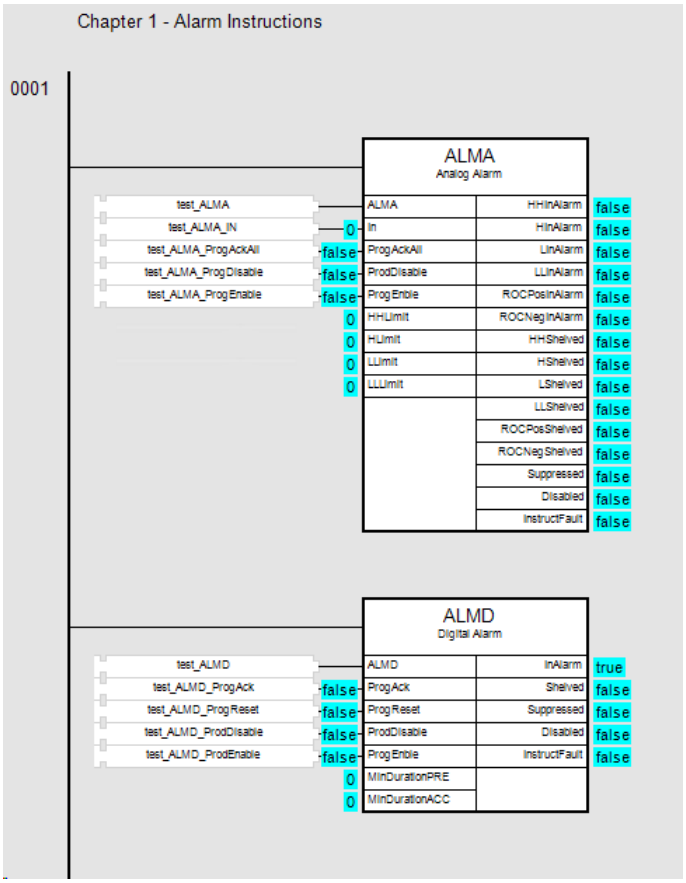



The flyover help can also show embedded Rockwell Compute expressions by hovering the mouse over a compute block title.




The PLC Viewer App shows the expression in its parameterized form.

Comments that appear inline in Rockwell code also appear in the same context in the PLC Viewer App.




## Set View Context

Users can select items from the **Assets & Function Block Templates** area of the PLC Viewer App window to set the context of a view. Also, users can select navigation items from a running ViewApp to set the context of a

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

view. For more information about showing current PLC values of a ViewApp navigation item, see Navigation from a ViewApp.

The PLC Viewer App includes a set of navigational and context controls in a menu bar near the top of the window.




The **Zoom In** and **Zoom Out** controls at the left enable you to zoom in or out to show more or less detail in the view window.

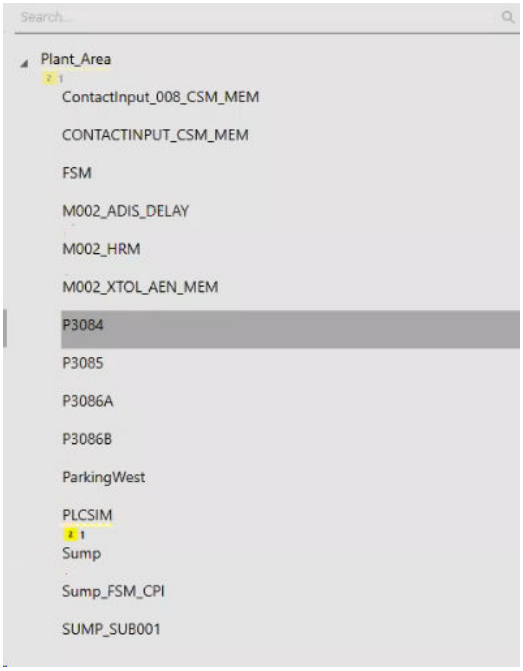
The **Back** and **Forward** controls enable you to move between previously shown context views in your current session. For example, if you have looked at three views in the PLC Viewer App, selecting **Back** will show the second context view. Using **Back** and **Forward** controls eliminates the need to scroll through the **Assets & Function Block Templates** area to reselect an item to show its view again.

The **Controller** field provides a drop-down list of controllers whose source logic files were added to the PLC Viewer App while configuring data sources. The source logic file includes the controller's programs. The PLC Viewer App can only show program data from the selected controller during runtime.

The **Scope** field appears when selecting an add-on instruction to enable selecting a specific instance of an add-on instruction in the control for animation.

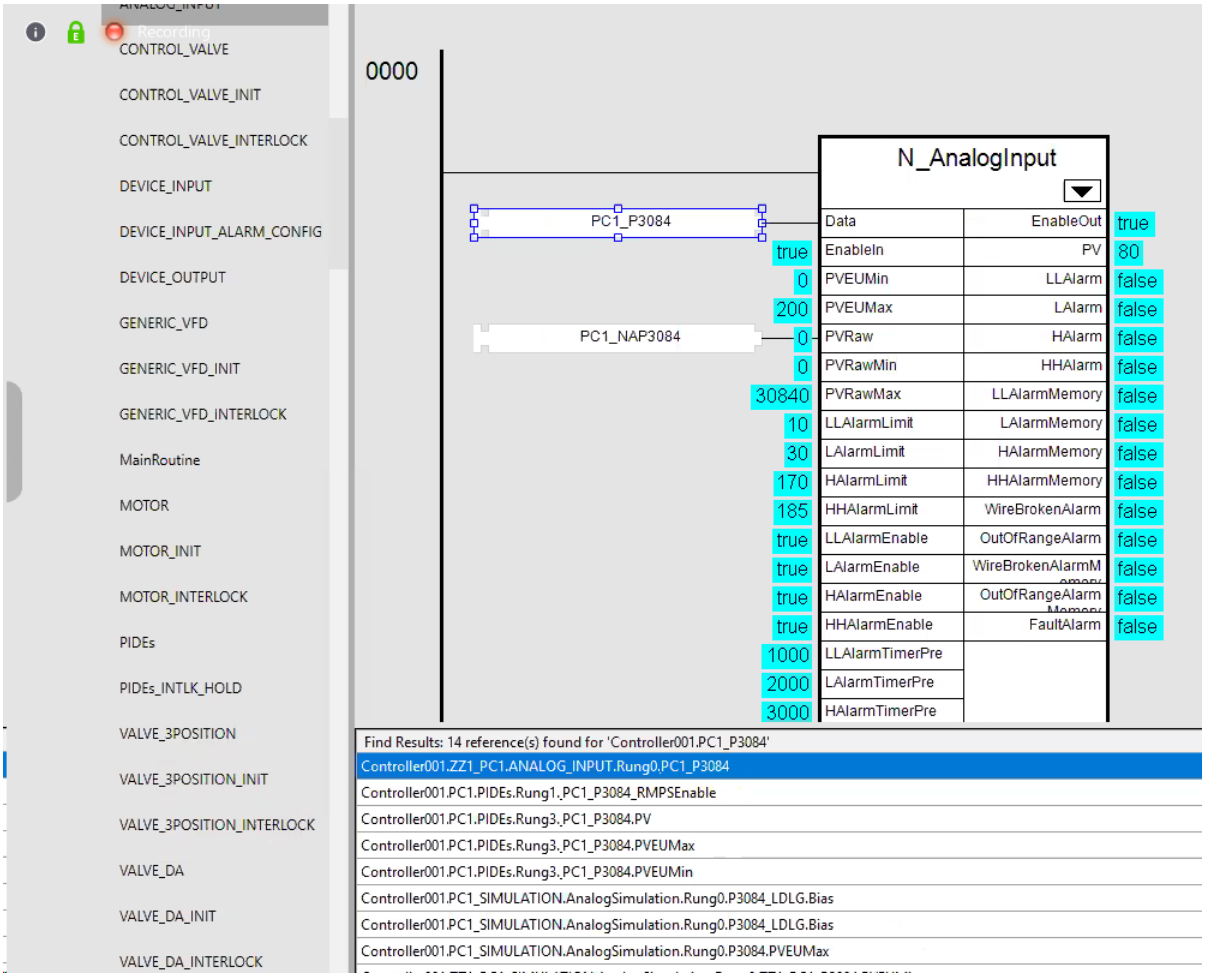
## Navigation from a ViewApp

The PLC Viewer App works in conjunction with other apps that are included in a running ViewApp. The following figure shows asset P3084 has been selected from the NavTree app placed in a layout pane of a ViewApp. A NavTree app shows the navigation model of a ViewApp and P3084 has been selected.




© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

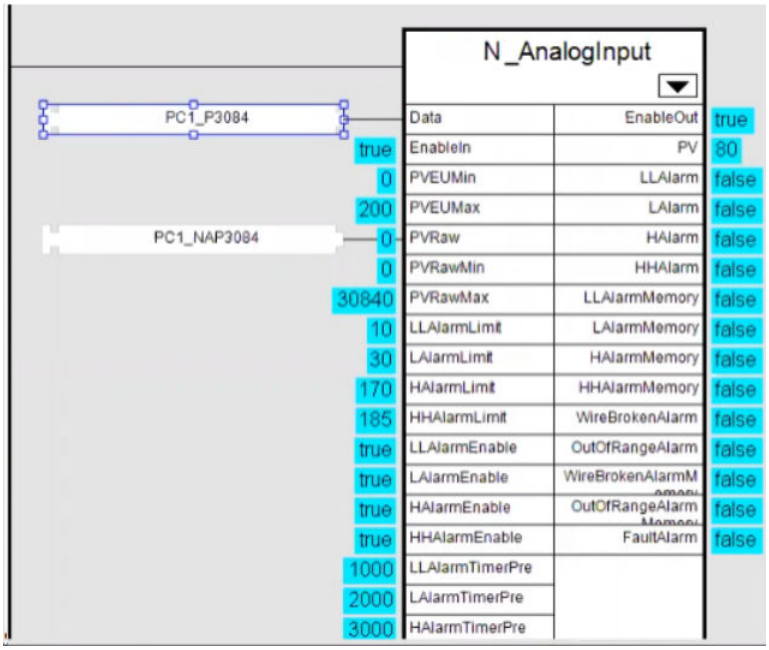
The ViewApp focus is set to the pane hosting the PLC Viewer App, which sets the view context to a function block in which PC1_P3084 is a data input




The **Find Results** field shows all instances of P3084 in Controller001. The Asset Mapping table with its list of associated asset names, controllers, and asset identifiers narrows the number of P3084 instances to the matching N_AnalogInput function block.

This function block shows the attributes and their values from the data of PC1_P3084 in a single view.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.



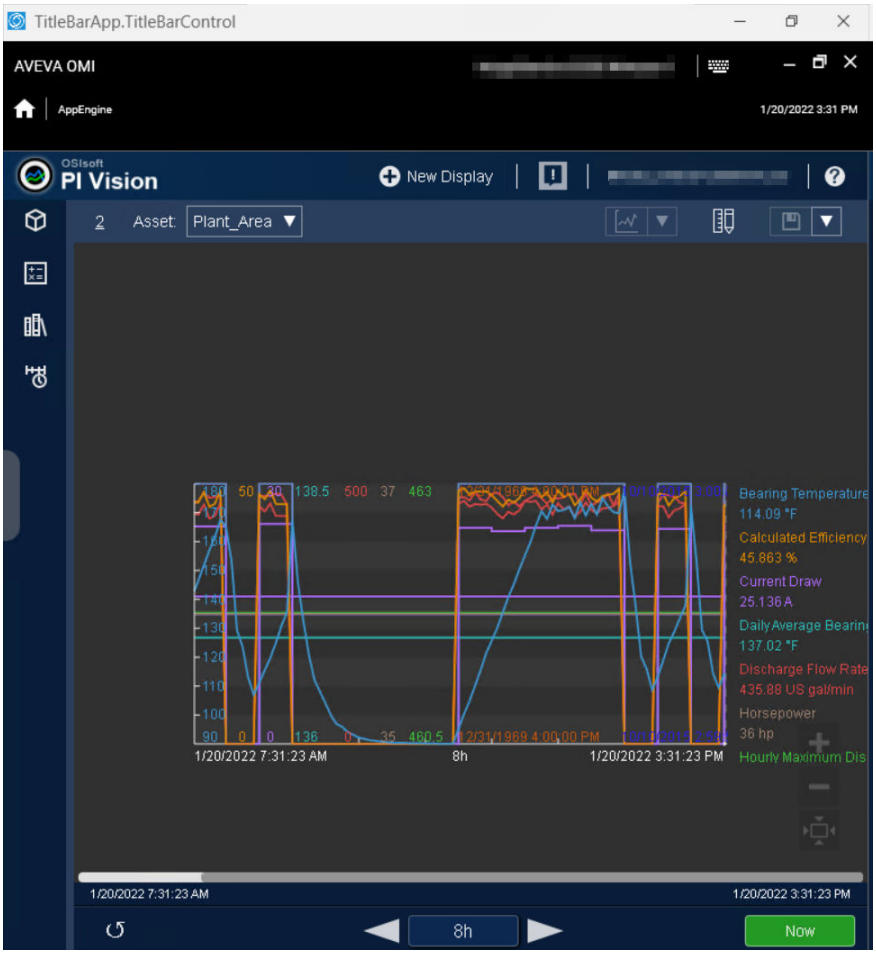

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Chapter 11 AVEVA™ PI Vision OMI App - Flex License Only

**Note:** The AVEVA PI Vision OMI App requires an AVEVA Flex license. It is not included in the product installation. If you have a Flex license, see How to Download and Install the PI Vision App for installation instructions.

The AVEVA™ PI Vision OMI App enables a PI Vision dashboard or ad hoc display to be shown within a layout pane of a running ViewApp. Displays can be configured to follow the current navigation context, and thus allow users to view the status of assets in different locations. In this document, the AVEVA™ PI Vision OMI App is also referred to as the OMI app to distinguish between the app and the native PI Vision application.

The OMI app incorporates the ease-of-use and fast access for which PI Vision is noted. The OMI app also allows some of PI Vision's ad hoc visualization capabilities, including trends, meters and charts, to be utilized directly in an OMI ViewApp. Note that the OMI app includes only a subset of PI Vision's capabilities.




## AVEVA PI Vision OMI App Requirements

Preparing the PI Vision OMI App to run in an OMI ViewApp includes several preliminary steps that must be completed by both PI Vision designers and ViewApp builders. The primary focus of this User Guide is to describe the work done by the ViewApp builder to integrate the PI Vision OMI App into System Platform.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Compatible PI System Versions

The AVEVA PI Vision OMI App is compatible with the following OSIsoft PI System products:

- AF SDK: version 2.10. The AF SDK is used by ad hoc displays within the OMI app for search and retrieval of data items when in context mode.
- PI Coresight: version 3.0 and later. PI Coresight 3.0 was originally named PI Coresight 2016, and was renamed PI Vision 2017 at the time of the version 3.2 release.

### AVEVA PI Vision OMI App Requirements

Before you configure the AVEVA PI Vision OMI App, you must:

- Be familiar with the PI Vision system.
- Have an operational PI Vision application server.
- Have Asset Framework (AF) server(s), data archive server(s), and any other required PI System components running and configured. All databases and other components of the PI System must be installed and configured with the appropriate user access permissions as needed for the displays you want to create and use at run time.
- Have a hierarchy of assets that exists with the same name as it appears in the OMI Navigation Model hierarchy.
- OSIsoft PI System products, including the Asset Framework server and PI Vision server, must be in the same domain as the AVEVA OMI client workstation. Make sure that users of the OMI client workstations, including the logged-in Windows user and the user logged-in to the OMI ViewApp, have user permissions to access the PI System products.
- OMI client workstations must have the PI System AF client installed, and have the appropriate databases and servers configured. This is required for contextualization to work within the PI Vision OMI App.
- Have an SSL digital certificate from your PI Vision server node installed on OMI client workstations that will run the PI Vision OMI App. See SSL Certificate for Run-Time Nodes for details.
- Have enough experience with System Platform to be able to create screen profiles, layouts, and ViewApps.

  **Note:** A Flex license is required to download the PI Vision OMI App from the AVEVA System Platform product website.

Make sure that the asset hierarchy and asset names match between the hierarchies by renaming assets and reconfiguring hierarchies as needed. Synchronization between the two will allow the PI Vision app to work in the context of the currently selected asset in the OMI ViewApp during run time.

Note that the PI Vision OMI App does not automatically synchronize the System Platform hierarchy with the Asset Framework server hierarchy of the PI System. This synchronization work is outside the scope of this user guide.

## How to Download and Install the PI Vision App

If you have an AVEVA Flex license, you can download the Pi Vision app from the AVEVA Product Hub, then install it. Follow the procedures below.

### To download the Microsoft Power BI app

1. Open the System Platform IDE.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

2. From the **Home** ribbon, select **Galaxy**, then **Import**.
3. Select **Objects**,then **Explore product hub**.

   **Note:** You can also go directly to the Product Hub using this URL: https://softwaresupportsp.aveva.com/#/producthub
4. On the Product Hub, for **Product**, select **System Platform**.
5. For the **Download Type**, select **Add On**.
6. From the list, select the PI Vision app.

The application is downloaded as a .exe file which includes:

- a .aaPKG file containing the application itself
- a Libs folder containing needed library files
- a batch file which installs the library files
- a PDF User Guide for the app
- an HTML ReadMe file with additional information

### To import the PI Vision App

1. In Windows Explorer, double click the **AVEVA OMI App for PI Vision.exe** file to extract its contents. Select a destination folder that is accessible from the System Platform IDE.
2. In the System Platform IDE, from the **Home** ribbon, select **Galaxy**, then **Import**.
3. Select **Objects**, then **From package**.
4. Browse to the location of the .aaPKG file, select the file, and select **Open**.
5. On the **Import preferences** dialog box, leave the default selections and select **Import**.

This imports the app at the root level of the Visualization folder. You can drag it to any desired location in the Visualization folder.

### To copy the required .dll file

Perform the following steps on each platform that will host an OMI ViewApp containing the PI Vision app:

1. Copy the **Libs** folder and the **InstallSharedLibs-RunAsAdmin.bat** file hat were extracted from **AVEVA OMI App for PI Vision.exe** to the platform.
2. In Windows Explorer, right-click **InstallSharedLibs-RunAsAdmin.bat** and select **Run as Administrator**.

The batch file copies the .dll file from **Libs** to the proper folder location.

Be sure to repeat this procedure on every platform that will host a ViewApp containing the PI Vision app.

## SSL Certificate for Run-Time Nodes

An SSL certificate must be installed on OMI workstations that will use the PI Vision OMI App at run time. This must be the same SSL certificate that is installed on the PI Vision application server.

If an SSL certificate is not configured, using the PI Vision OMI App for Dashboard displays in context mode will fail and result in an SSL exception. Contextualization is enabled by the **Follow Current Context** property. For more information, see Contextualization.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

For additional information about using the certificate, see the following sections:

- Export the PI Vision SSL Digital Certificate
- Install the Exported SSL Digital Certificate

## Export the PI Vision SSL Digital Certificate

Export the SSL digital certificate from your PI Vision application server. This certificate is normally obtained from a trusted third party trusted certificate registrar, and is installed on the PI Vision application server during the installation of PI Vision software. For more information, refer to the *PI Vision Installation and Administration Guide*.

The simplest way to access the certificate is through a web browser on the PI Vision web server.

1. Open a PI vision dashboard in the browser of your choice on the PI Vision application server.
2. Click on the site information (the lock symbol) in the address bar. This may vary based on the type of browser you are using.
3. In the connection details menu, click to see the certificate. This option varies, based on which browser you are using.

   Look for **Show Certificate** or the **Certficate Icon** and click on it. This will bring up the **Certificate window** where you can click on the **Details** tab.
4. Click on the **CopyToFile** button. This opens the **Export Certificate Wizard**. Follow the wizard steps to finish exporting the certificate.

Note that there are a number of different methods to export this certificate from the PI Vision web server. Some of these methods are listed in the following **Digicert** web page:

-

## Install the Exported SSL Digital Certificate

The SSL certificate you exported from the PI Vision server must be installed on each AVEVA OMI client workstation that will run the PI Vision OMI App.

A simple way to install the certificate is as follows:

1. Go to the location of the downloaded certificate and right-click on the certificate file.
2. From the context menu, select the **Install Certificate** option. This opens the **Import Certificate Wizard**.
3. Follow the wizard steps to save the certificate in the appropriate certificate store, as directed by your IT department.

Note that there are a number of different methods to install the certificate on the client machine. Some of these methods are listed in the following **Digicert** article:

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Configure the AVEVA PI Vision OMI App

Preparing the AVEVA PI Vision OMI App to run in an AVEVA ViewApp includes several major workflows that must be completed by both PI Vision designers and ViewApp builders. The primary focus of this User Guide is to describe the work done by the ViewApp builder to integrate the PI Vision OMI App into System Platform.

On the PI Vision side, a designer must ensure that the hierarchy of assets matches the System Platform hierarchy. In addition, when using PI Vision dashboards when the PI Vision OMI App is in context mode, keywords must be added to ensure that the correct dashboard is selected and displayed by the OMI app at run time.

Configuring the OMI app requires setting properties for the app in the System Platform Layout Editor. These properties are described in the following sections.

Note that some validation of property settings is done during configuration. Configuration errors will be highlighted by a red box around the mis-configured item.

## Configure PI Vision Properties

PI Vision app properties can be shown in the Layout or ViewApp editors by placing the PI Vision app on a layout pane. After adding the app to a pane, its properties appear on the **Properties** page by functional groups.

**To configure PI Vision OMI App properties**

1. Open the Layout or ViewApp Editor and select the **Toolbox** tab.
2. Open the folder in the **Toolbox** that contains the **PIVisionApp** and select it.
3. Drag and drop the **PIVisionControl** (the app thumbnail) onto a layout pane.
4. Select the **Properties** tab for the layout.

   The **Properties** tab shows the properties of the PI Vision App, and is similar to the following screen capture. Properties are categorized as:

   - General: General properties are similar to the general properties of other OMI apps and define the control, content, and pane names.
   - Connection: Connection properties define how the app will connect to the PI Vision server and website.
   - Dashboard Displays: These properties define if a dashboard (saved) display will be shown, and define the display to be shown. Ad hoc and freeform displays must be disabled if a dashboard display will be shown.
   - Ad Hoc Displays: These properties define the parameters for showing ad hoc (temporary) display queries. Dashboard and freeform displays must be disabled if an ad hoc display will be shown.
   - Freeform Displays: These properties define the parameters for showing a freeform display from a URL. Ad hoc and dashboard displays must be disabled if a freeform display will be shown.
   - Context: This property disables or enables the ability to view the attributes of the currently selected asset in dashboard and ad hoc displays. If disabled, the app will show only the performance of those attributes defined by property settings within the dashboard or ad hoc display settings.

     Note: Context is not applicable to freeform displays.

   - Time Range: These optional properties set start and end times for dashboard or ad hoc displays (not applicable to freeform displays).

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- Appearance: These properties disable/enable toolbars and the Kiosk mode for dashboard and ad hoc displays (not applicable to freeform displays).
- Browser: This property lets you designate a cascading style sheet to control the appearance of dashboard and ad hoc displays (not applicable to freeform displays).

For more information about PI Vision OMI App properties, see PI Vision OMI App Properties.




Configuration errors are indicated by a red outline around the misconfiguration.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### PI Vision OMI App Properties

<table>
<tr><th colspan="2">Connection</th></tr>
<tr><td>Web Server</td><td>Fully qualified computer name of the PI Vision server.
<table>
<tr><th>Underlying Data Type</th><th>Default Value</th><th>Read/Write Mode</th><th>Runtime Property</th><th>Scriptable</th></tr>
<tr><td>String</td><td>Empty</td><td>Read/Write</td><td>Yes</td><td>Yes</td></tr>
</table></td></tr>
<tr><td>Website</td><td>Name of the PI Vision website. Typically, the website name is PIVision.
<table>
<tr><th>Underlying Data Type</th><th>Default Value</th><th>Read/Write Mode</th><th>Runtime Property</th><th>Scriptable</th></tr>
<tr><td>String</td><td>Empty</td><td>Read/Write</td><td>Yes</td><td>Yes</td></tr>
</table></td></tr>
<tr><th colspan="2">Dashboard Displays</th></tr>
<tr><td>View Dashboard Display</td><td>Boolean property that enables/disables viewing a saved display from the PIVision server. If True, the Dashboard Id is used to determine which dashboard display to show at runtime.<br><br>Boolean properties for setting display mode (View Dashboard Display, View Ad hoc Display, View Freeform Display) are mutually exclusive. If this setting is True, the other display settings must be set to False.
<table>
<tr><th>Underlying Data Type</th><th>Default Value</th><th>Read/Write Mode</th><th>Runtime Property</th><th>Scriptable</th></tr>
<tr><td>Boolean</td><td>True</td><td>Read/Write</td><td>Yes</td><td>Yes</td></tr>
</table></td></tr>
</table>

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

<table>
<tr><th colspan="2">Dashboard Displays</th></tr>
<tr><td>Dashboard Id</td><td>Display Id, as an integer of a saved PIVision display URL. For example, the Display Id is 3117 for a display with the following URL: https://PIVisionwebserver/PIVision/#/Displays/3117/PowerAnalysis
<table>
<tr><th>Underlying Data Type</th><th>Default Value</th><th>Read/Write Mode</th><th>Runtime Property</th><th>Scriptable</th></tr>
<tr><td>Integer</td><td>0</td><td>Read/Write</td><td>Yes</td><td>Yes</td></tr>
</table></td></tr>
<tr><td>Asset Path</td><td>Specifies an asset path for an existing display to swap related assets that share the same PI AF template.<br><br>Note: This is an additional, optional configuration on the saved dashboard display.<br><br>This property lets you configure an existing display to use other assets that share the same AF template. See Configure Dashboard Displays for more information.
<table>
<tr><th>Underlying Data Type</th><th>Default Value</th><th>Read/Write Mode</th><th>Runtime Property</th><th>Scriptable</th></tr>
<tr><td>String</td><td>Empty</td><td>Read/Write</td><td>Yes</td><td>Yes</td></tr>
</table></td></tr>
<tr><th colspan="2">Ad Hoc Displays</th></tr>
<tr><td>View Ad hoc Display</td><td>Boolean property that enables/disables the ad hoc display mode. If True, you can specify data items to show in a single temporary trend (ad hoc) display.<br><br>Boolean properties for setting display mode (View Dashboard Display, View Ad hoc Display, View Freeform Display) are mutually exclusive. If this setting is True, the other display settings must be set to False.
<table>
<tr><th>Underlying Data Type</th><th>Default Value</th><th>Read/Write Mode</th><th>Runtime Property</th><th>Scriptable</th></tr>
<tr><td>Boolean</td><td>False</td><td>Read/Write</td><td>Yes</td><td>Yes</td></tr>
</table></td></tr>
</table>

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

<table>
<tr><th colspan="2">Ad Hoc Displays</th></tr>
<tr><td>Symbol Type</td><td>Determines the type of symbol that is used for a temporary (ad hoc) display. Depending on the symbol type, you can add multiple data items per symbol. If you do not specify a symbol type, the property uses Trend as the default.<br><br>Each specified data item in an ad hoc display is shown in a single trend, using the specified Symbol Type. The symbol type is designated by an enum type, which correlates to a PIVisionSymbolType, and can be any of the following:<br><br>Trend (default)<br>Value<br>Table<br>VerticalGauge<br>HorizontalGauge<br>RadialGauge<br>XYPlot<br>ACT (Asset Comparison Table)<br><br>If no symbol is specified, a trend symbol type is used for the ad hoc display.<br><br><table><tr><th>Underlying Data Type</th><th>Default Value</th><th>Read/Write Mode</th><th>Runtime Property</th><th>Scriptable</th></tr><tr><td>Enum</td><td>Trend</td><td>Constant</td><td>No</td><td>No</td></tr></table></td></tr>
<tr><td>Data Items</td><td>Specifies one or more data items for a temporary (ad hoc) PI Vision display. These items will appear regardless of the currently selected navigation node, even if Follow Current Context is True and you have navigated away from the asset containing the specified data items. See Configure Ad Hoc Displays for additional information about the Data Items property.<br><br><table><tr><th>Underlying Data Type</th><th>Default Value</th><th>Read/Write Mode</th><th>Runtime Property</th><th>Scriptable</th></tr><tr><td>String</td><td>Empty</td><td>Read/Write</td><td>Yes</td><td>Yes</td></tr></table></td></tr>
</table>

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

<table>
<tr><th colspan="2">Ad Hoc Displays</th></tr>
<tr><td>Context Asset Server</td><td>Name of the of asset server for the PI system. The app uses this property to connect to the AF server using the currently logged in Windows user credential. Once connected, it gets attributes automatically from the currently selected asset, when the Follow Current Context property is enabled.<br><br>This is an optional property. If a Context Asset Server is not configured, the PI Vision OMI App tries connecting to the default AF Server.<br><br>
<table>
<tr><th>Underlying Data Type</th><th>Default Value</th><th>Read/Write Mode</th><th>Runtime Property</th><th>Scriptable</th></tr>
<tr><td>String</td><td>Empty</td><td>Read/Write</td><td>Yes</td><td>Yes</td></tr>
</table>
</td></tr>
<tr><td>Context Asset Database</td><td>Name of the Asset database that contains the attributes of the current asset on a given AF server.<br><br>This property is used to connect to the AF server to get the attributes automatically from the currently selected asset, when the Follow Current Context is enabled.<br><br>This is an optional configuration property. If a context database is not specified, the PI Vision OMI App tries to discover the current selected asset from the default database of the given AF server.<br><br>
<table>
<tr><th>Underlying Data Type</th><th>Default Value</th><th>Read/Write Mode</th><th>Runtime Property</th><th>Scriptable</th></tr>
<tr><td>String</td><td>Empty</td><td>Read/Write</td><td>Yes</td><td>Yes</td></tr>
</table>
</td></tr>
</table>

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

<table>
<tr><th colspan="2">Ad Hoc Displays</th></tr>
<tr><td>Max Context Data Items to Show</td><td>Determines the number of data items from the current context that can be shown in the ad hoc display, when the Follow Current Context property is enabled. A value of 10 or less is recommended. The default is 10.<br><br>When Follow Current Context is disabled, the Max Context Data Items property is inactive, and any number entered is ignored.<br><br>
<table>
<tr><th>Underlying Data Type</th><th>Default Value</th><th>Read/Write Mode</th><th>Runtime Property</th><th>Scriptable</th></tr>
<tr><td>Integer</td><td>10</td><td>Read/Write</td><td>Yes</td><td>Yes</td></tr>
</table></td></tr>
<tr><th colspan="2">Freeform Displays</th></tr>
<tr><td>View Display URL</td><td>Boolean property that enables/disables the freeform display mode. If True, the Display URL Parameters property appends to the base URL configured in the Connection properties, and shows the display called by the complete URL at runtime.<br><br>Boolean properties for setting display mode (View Dashboard Display, View Ad hoc Display, View Freeform Display) are mutually exclusive. If this setting is True, the other display settings must be set to False.<br><br>When freeform display mode is enabled, Display URL Parameters is the only other property (in addition to Connection properties) that is used for configuring the display for the given PI Vision webserver and website. All other properties, including Time Range and Appearance, are ignored.<br><br>
<table>
<tr><th>Underlying Data Type</th><th>Default Value</th><th>Read/Write Mode</th><th>Runtime Property</th><th>Scriptable</th></tr>
<tr><td>Boolean</td><td>False</td><td>Read/Write</td><td>Yes</td><td>Yes</td></tr>
</table></td></tr>
</table>

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

<table>
<tr><th colspan="2">Freeform Displays</th></tr>
<tr><td>Display URL Parameters</td><td>Specifies parameters to be appended to the base path of the configured PI Vision web server URL for a display from PI Vision. The Display URL Parameters property lets you directly call displays that are not dashboard (saved) or ad hoc displays, such as EventDetails or EventComparison displays. You can also include additional parameters (Time Range, Appearance, etc.).<br>For example:<ul><li>To call an Event Comparison, you would enter something like "EventComparison/24"</li><li>To call an Event Detail display, you would enter something like "EventDetails?srcdisplayid=23&server=PIVISIONSERVERP&eventid=c80dc366-82e4-11ec-a058-00155d754303"</li></ul>
<table>
<tr><th>Underlying Data Type</th><th>Default Value</th><th>Read/Write Mode</th><th>Runtime Property</th><th>Scriptable</th></tr>
<tr><td>String</td><td>Empty</td><td>Read/Write</td><td>Yes</td><td>Yes</td></tr>
</table></td></tr>
<tr><th colspan="2">Time Range</th></tr>
<tr><td>Start Time</td><td>Specifies the start time of a dashboard or ad hoc display. If this property is not specified, the start time defaults to the current time at run time.<br><br>Note: Start and end times must be used in pairs. OSIsoft recommends using ISO 8601 standards because they are not affected by time zones. Start/End time properties cannot be used with freeform displays.
<table>
<tr><th>Underlying Data Type</th><th>Default Value</th><th>Read/Write</th><th>Runtime Property</th><th>Scriptable</th></tr>
<tr><td>String</td><td>Empty</td><td>Read/Write</td><td>Yes</td><td>Yes</td></tr>
</table></td></tr>
</table>

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

<table>
<tr><th colspan="2">Time Range</th></tr>
<tr><td>End Time</td><td>Specifies the end time of a display. If this property is not specified, the end time defaults to eight hours from the current time.<br><br>Note: Start and end times must be used in pairs. OSIsoft recommends using ISO 8601 standards because they are not affected by time zones. Start/End time properties cannot be used with freeform displays.<br><br>
<table>
<tr><th>Underlying Data Type</th><th>Default Value</th><th>Read/Write</th><th>Runtime Property</th><th>Scriptable</th></tr>
<tr><td>String</td><td>Empty</td><td>Read/Write</td><td>Yes</td><td>Yes</td></tr>
</table>
</td></tr>
<tr><th colspan="2">Context</th></tr>
<tr><td>Follow Current Context</td><td>If enabled, automatically discovers the applicable ad hoc or dashboard display (depending on mode) associated with the asset in the AF server. Context cannot be used with freeform displays.<br><br>
<table>
<tr><th>Underlying Data Type</th><th>Default Value</th><th>Read/Write</th><th>Runtime Property</th><th>Scriptable</th></tr>
<tr><td>Boolean</td><td>False</td><td>Read/Write</td><td>Yes</td><td>Yes</td></tr>
</table>
</td></tr>
</table>

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

<table>
<tr><th colspan="2">Appearance</th></tr>
<tr><td>Hide Toolbar</td><td>Boolean value that determines if the display toolbar is shown or hidden. When set to true, the toolbar is hidden. This property cannot be used with freeform displays.
<table>
<tr><th>Underlying Data Type</th><th>Default Value</th><th>Read/Write</th><th>Runtime Property</th><th>Scriptable</th></tr>
<tr><td>Boolean</td><td>True</td><td>Read/Write</td><td>Yes</td><td>Yes</td></tr>
</table></td></tr>
<tr><td>Hide Timebar</td><td>Boolean value that determines if the display timebar is shown or hidden. When set to true, the timebar is hidden. This property cannot be used with freeform displays.
<table>
<tr><th>Underlying Data Type</th><th>Default Value</th><th>Read/Write</th><th>Runtime Property</th><th>Scriptable</th></tr>
<tr><td>Boolean</td><td>False</td><td>Read/Write</td><td>Yes</td><td>Yes</td></tr>
</table></td></tr>
<tr><td>Hide Sidebar</td><td>Boolean value that determines if the display sidebar is shown or hidden. When set to true, the sidebar is hidden. This property cannot be used with freeform displays.
<table>
<tr><th>Underlying Data Type</th><th>Default Value</th><th>Read/Write</th><th>Runtime Property</th><th>Scriptable</th></tr>
<tr><td>Boolean</td><td>True</td><td>Read/Write</td><td>Yes</td><td>Yes</td></tr>
</table></td></tr>
</table>

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

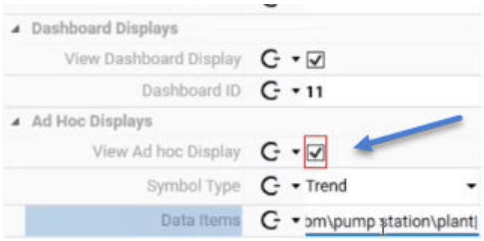
<table>
<tr><th colspan="2">Appearance</th></tr>
<tr><td>Kiosk Mode</td><td>Boolean value that determines if the PI Vision display is operating in kiosk mode. In kiosk mode, users cannot search for data or save the display. This property cannot be used with freeform displays.
<table>
<tr><th>Underlying Data Type</th><th>Default Value</th><th>Read/Write</th><th>Runtime Property</th><th>Scriptable</th></tr>
<tr><td>Boolean</td><td>True</td><td>Read/Write</td><td>Yes</td><td>Yes</td></tr>
</table></td></tr>
<tr><th colspan="2">Browser Property</th></tr>
<tr><td>StyleSheet</td><td>Applies a string-based cascading style sheet (CSS) to the PI Vision page.
<table>
<tr><th>Data Type</th><th>Default Value</th><th>Read-Write Mode</th><th>Runtime Property</th><th>Layout Scriptable</th></tr>
<tr><td>String</td><td>Empty</td><td>Read/Write</td><td>Yes</td><td>Yes</td></tr>
</table></td></tr>
</table>

## Types of Displays

The PI Vision OMI App lets you choose different types of displays to show in a particular pane during run time:

- Dashboard
- Ad Hoc
- Freeform

The types are mutually exclusive during configuration. Therefore, only one type can be configured for each instance of the PI Vision OMI App. If you enable more than one during configuration, an error indication (red highlight around the misconfiguration), will be shown.




Dashboard Displays, also called saved displays, show a previously saved display from your PI Vision server.

Ad Hoc Displays, also called temporary displays, show attributes from the specified asset server and asset database, and then plot the items on an ad hoc display.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

Freeform Displays let you specify a URL within the app during configuration. Freeform displays can be dashboards displays, comparison displays, or any other valid URL that contains the PI System data that you want to show at run time. In contrast to the other display types, you have to manually enter all URL parameters, instead of configuring properties that are then passed to a PI System server.

### Contextualized Displays

Both dashboard and ad hoc displays can be configured to to show attributes that belong to the currently selected asset. This is determined by the **Follow Current Context** property. When **Follow Current Context** is disabled (set to False), the display does not change when you select different assets. When **Follow Current Context** is enabled (set to True), the display changes to the context of the selected asset. See Contextualization for more information.

**Note:** Freeform displays cannot be contextualized.

## Dashboard Displays

Dashboard displays are saved displays on the PI Vision server. Each saved display has a unique ID (Display ID) that can be used to call the display. The **Display ID** property is used to designate which display to show in the ViewApp.

### Configure Dashboard Displays

Dashboard displays use the Dashboard ID, a component of the display URL, to find the display to be shown. The following properties must be specified to show dashboard displays in when the PI Vision OMI App is in non-contextual mode:

- **View Dashboard Display** must be True (set the checkmark next to the property).
- **Dashboard ID** must be set with an integer that matches the saved PI Vision dashboard ID to be displayed.

**View Dashboard Display** and and the other view boolean values (**View Dashboard Display, View Freeform Display**) are mutually exclusive. Make sure **View Ad hoc Display** and **View Freeform Display** are disabled if **View Dashboard Display** is enabled.

Each saved PI Vision display (dashboard) has a unique URL, which includes a unique number. The **Dashboard ID** property in the OMI app is configured with this number, for example:

https://PIVisionwebserver/PIVision/#/Displays/3117/PowerAnalysis

In this example, you would configure the Display ID property as 3117.

**Asset Path** is an optional property that you can use to to swap related assets that share the same PI Vision AF template with an existing dashboard display. Specify the asset by appending the asset to the URL, followed by the path of the new asset.

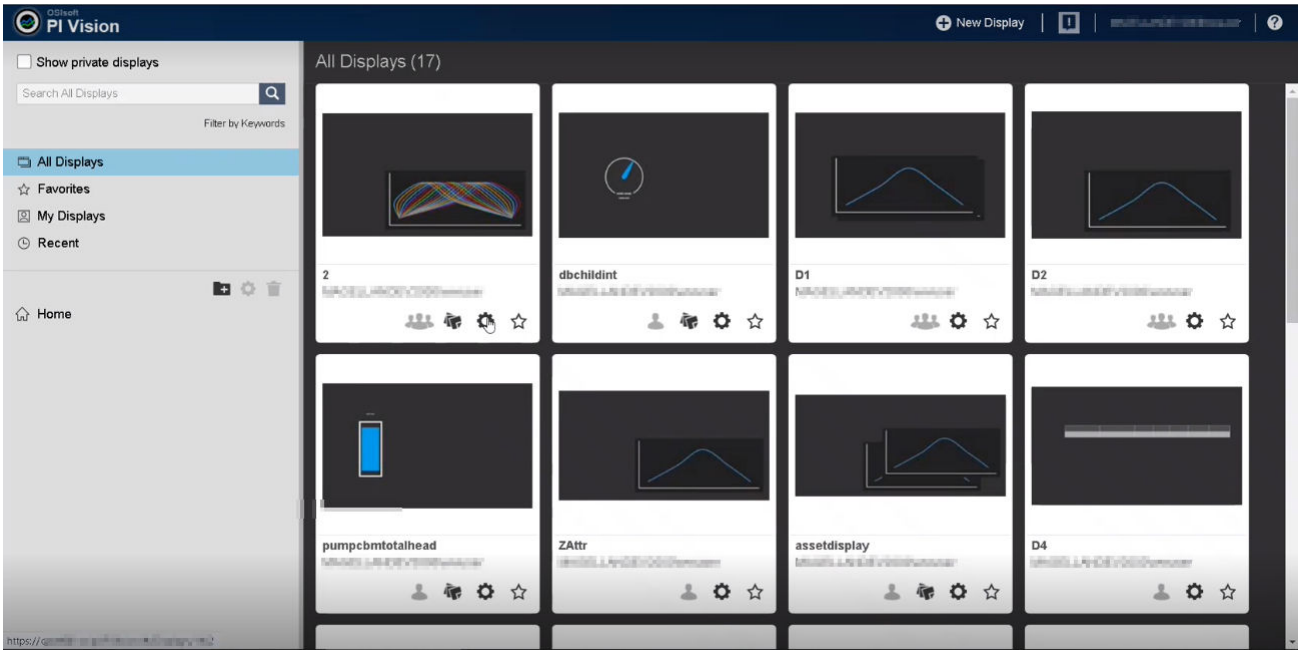
The **Asset Path** property lets you configure an existing display to use other assets that share the same AF template. To do this:

1. Obtain the paths of the assets you want to use to replace the existing assets on the display. You can find these paths in PI Vision search results, or in PI System Explorer.
2. Specify the asset path in this property to show in a display.

   Path for a data item on a PI AF server: \\AFServerName\DatabaseName\ParentElement\ChildElement

The following screenshot shows a number of saved displays on the PI Vision server.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




**Note:** Dashboard displays can be configured to show the status of different assets as you navigate around your system, via the **Follow Current Context** property. See Contextualized Dashboard Displays for more information.

## Ad Hoc Displays

To enable ad hoc (temporary) displays within the OMI App for PI Vision, you must set **View Ad hoc Display** to True by setting the checkmark.

This setting and the other view boolean values (**View Dashboard Display, View Freeform Display**) are mutually exclusive. Make sure the other display types are disabled, and that **Dashboard ID** is set to 0 when configuring ad hoc displays.

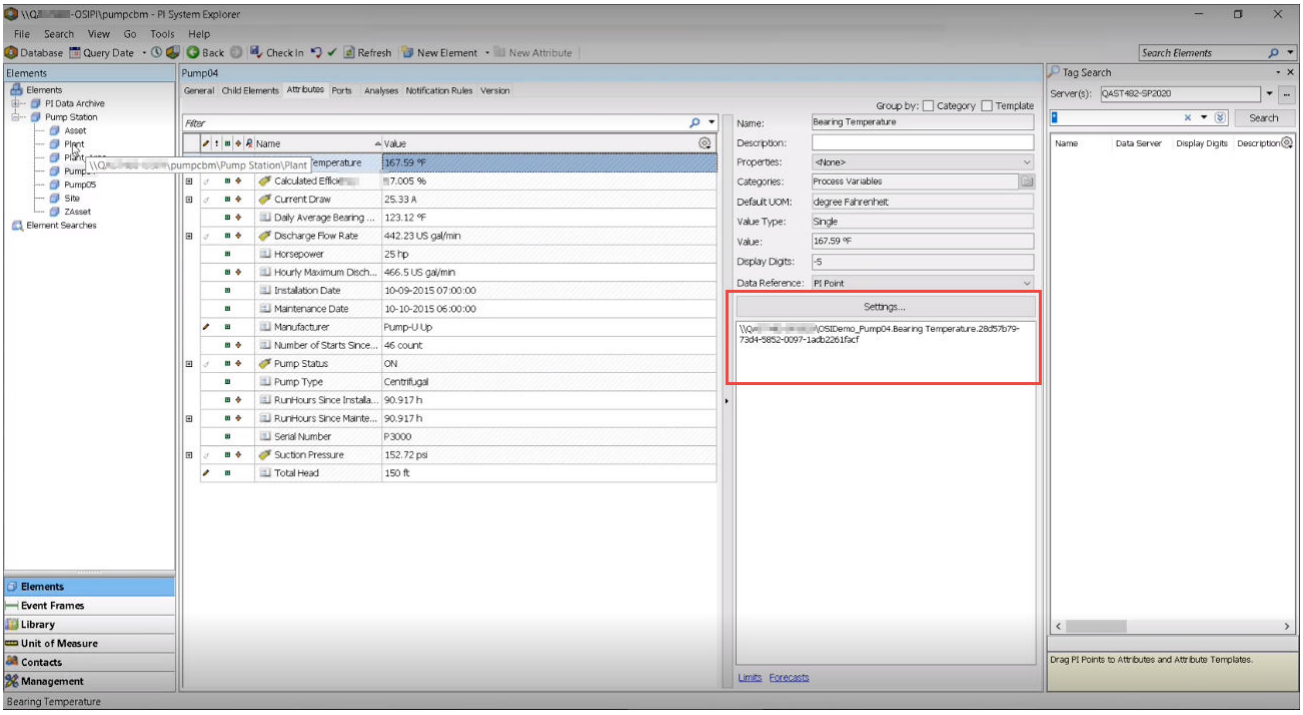
The **Symbol Type** property specifies a PIVisionSymbolType that shows each data item of the ad hoc display in a single trend.

### Configure Ad Hoc Displays

The **Data Items** parameter lets you designate the path on the PI Vision AF server to the data items that you want shown, regardless of the current context. The number of additional data items that you specify here has no effect on, and is not constrained by the number context items shown, as defined by the **Max Context Data Items to Show** property.

You can find the path to the data item by navigating to the asset in the PI System Explorer. Then, copy the path from the Settings pane.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




Use the following format to designate data items from an AF Server for display in the PI Vision OMI app:

\\AFServerName\DatabaseName\ParentElement\ChildElement|ChildAttribute

To select an item from a PI Data Archiver server, use the following format:

\\ArchiveServerName\TagName

Use the full URI of the asset or attribute. For example, to plot all attributes of an asset at run time, provide the URI of the asset, as shown in following example:

\\AFServer1\pumpcbm\pump station\plant

To specify a particular attribute of an asset to display, append the attribute name to the asset name, using the pipe symbol as separator between asset name and attribute:

\\AFServer1\pumpcbm\pump station\plant|bearing temperature

To specify multiple attributes, use a semicolon as the separator between attributes. You must provide the full asset name for each attribute specified, even if all the attributes belong to the same asset.

\\AFServer1\pumpcbm\pump station\plant|bearing temperature; \\AFServer1\pumpcbm\pump station\plant|pump\flow rate; \\AFServer1\pumpcbm\pump station\plant|pump speed

**Note:** Ad hoc displays can be configured to show show the status of different assets as you navigate around your system, via the **Follow Current Context** property. See Contextualized Ad Hoc Displaysfor more information.

### Syntax Rules for Data Items in Ad Hoc Displays

The following points summarize the syntax rules for specifying data items to show in an ad hoc display:

- Use the pipe (|) character to separate the attribute name from the asset name.
- Use semicolons to separate multiple data items. You must provide the full path to the server for each data item.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

Example:
\\AFserver1\Houston\B-210|Temperature;\\AFserver\B-210|Pressure

- If you specify an asset in the Data Items parameter without including an attribute, all of the plottable attributes that belong to the asset will appear in the symbol.

## Freeform Displays

To enable freeform displays within the OMI App for PI Vision, you must set **View Freeform Display** to True by setting the checkmark.

**View Freeform Display** and the other view boolean display type values (**View Dashboard Display, View Ad Hoc Display**) are mutually exclusive. Make sure the other display types are disabled, and that Dashboard ID is set to 0 when configuring freeform displays.

Freeform displays use the base URL configured for the app by the Web Server and Website parameters, and then append additional arguments to the base URL through the **Display URL Parameters** property. To configure a freeform display, you must enter the **Display URL Parameters** property with parameters needed. See PI Vision OMI App Properties for details about the **Display URL Parameters** property.

Other properties that can be configured in the OMI app, such as time and appearance parameters are ignored. To pass these additional parameters, you must configure them in the Display URL Parameters property.

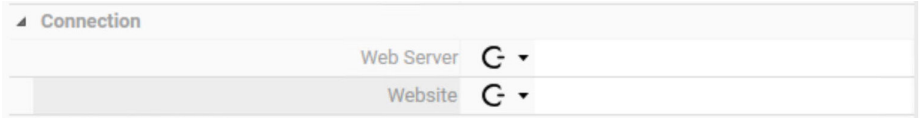
**Note:** Freeform displays cannot be contextualized.

### Configure Freeform Displays

#### URL Composition

A typical URL for a freeform display includes the following components:

**Base URL:** The base URL uses the configured **Web Server** and **Website** properties under the Connection category. Base URL example:
https://PISystemServer/PIVision/#




**URL Parameters:** You can pass additional URL parameters that are appended to the base URL, via the **Display URL Parameters** property. For example, you can pass parameters to show an event comparison display, to configure the pane appearance via a stylesheet or to hide the toolbar, or to configure a time range.

For an Event Detail display, enter the following **Display URL Parameters**:

EventDetails?srcdisplayid=23&server=PIVISIONSERVERP&eventid=c80dc366-82e4-11ec-a058-00155d754303

For an Event Comparison display, enter:

EventComparison/24

To hide the toolbar on an Event Display, enter:
EventDetails?server=srcdisplayid=23&server=PIVISIONSERVERP&eventid=c80dc366-82e4-11ec-a058-00155d754303&hidetoolbar

To configure the time range on an event Comparison Display, enter:

EventComparison/24?starttime2/1/2022&endtime2/2/2022

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

## Time Properties

Dashboard and ad hoc displays allow you to specify start and end times for visualizing your data.

**Note:** The start/end time properties cannot be directly applied to freeform displays. If you wish to provide a time interval for a freeform display, you must pass the start and end times through the **Display URL Parameters** property.

**Start Time:** Specifies the start time of the display. If this property is not specified, the start time defaults to the current time. Start and end times must be used in pairs. OSIsoft recommends using ISO 8601 standards because they are not affected by time zones.

**End Time:** Specifies the end time of the display. If this property is not specified, the end time defaults to 8 hours from the current. Start and end times must be used in pairs.

If no start and end times are specified, the time range of the saved display applies.

## Contextualization

Both dashboard displays and ad hoc displays can be contextualized. Contextualization is enabled by setting the **Follow Current Context** property to true. With contextualization enabled, data applicable to the currently-selected asset is shown for both dashboard and ad hoc displays. Your OMI asset hierarchy and navigation node names must correlate with the structure of your PI Vision AF database for contextualization to work.

**Note:** Freeform displays cannot be contextualized.

### Contextualized Dashboard Displays

Contextualization for dashboard displays works by discovering the dashboard that contains the same keyword as the name of the current asset.

Associate the saved PI Vision dashboard displays with one or more keywords, where at least one of the keywords is an asset name. The keyword list from the saved PI Vision displays is matched against the currently selected asset name in OMI ViewApp.

If more than one dashboard has the same keyword that matches the asset, the first dashboard that matches the asset name is shown, and the remainder of the dashboards are ignored. A custom flag in the logger will provide a message if this occurs.

From the keyword data, the Dashboard ID is retrieved by an internal web API call to PI Vision. This Dashboard ID is then used to retrieve the saved display.

The currently logged-in Windows user credential is used to retrieve the keyword and Dashboard ID.

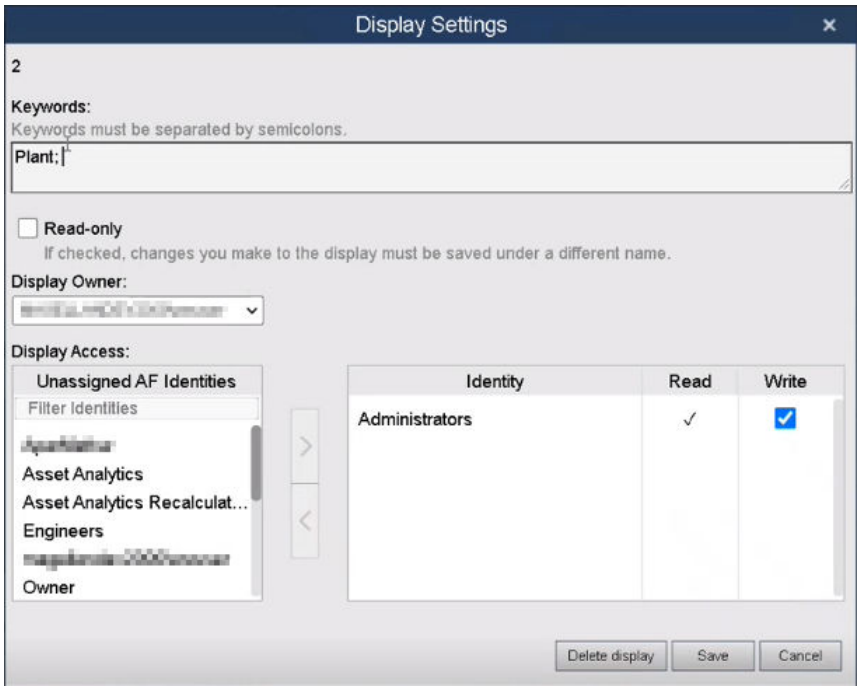
#### To contextualize Dashboard Displays

1. Enable the **Follow Current Context** property.
2. Use the PI Vision UI to add keywords to the saved display. This is required for dashboard displays to work contextually within the PI Vision OMI app.

   Keywords assigned to displays should correlate with the appropriate asset names. As you navigate to an item with has the same name as a keyword, the applicable display is shown.

   **Note:** Keywords are added to displays from within the PI Vision application, not the OMI app.

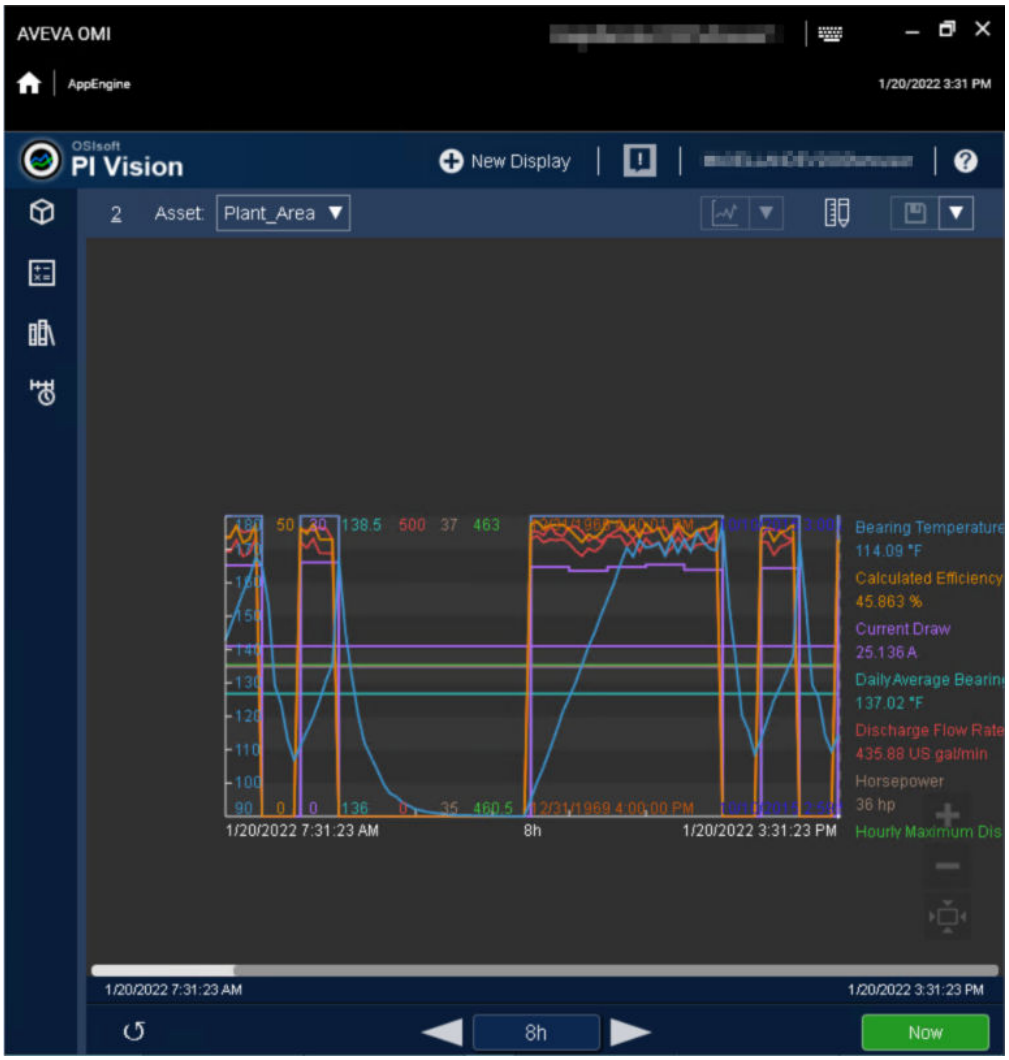
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




You can add multiple keywords, using a semicolon as the separator. The PI Vision OMI app then searches for displays within the PI Vision Asset Framework to find the display that contains the matching keyword as you navigate to different assets. For example, adding the keyword "Plant" to a display will allow the OMI app to find the display that is applicable when the currently-selected asset is named "Plant."

If more than one dashboard display contains the same keyword, the PI Vision OMI app will use the first display that was saved with the keyword.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




## Contextualized Ad Hoc Displays

Contextualization for ad hoc displays works by discovering the given number of data items for an asset from the selected asset server and asset database, and plotting the items on the selected symbol type. Up to 10 context tags are shown by default. If the asset you are viewing has more than 10 tags, the first 10 that are listed alphabetically are shown. Showing more than 10 may impact performance.

The current asset is searched in the AF server and AF database, as specified by the **Context Asset Server** and **Context Asset Database** properties of the app. If a context server and database are not specified, the default server and database are used.

When the OMI app connects to the AF server and database, it retrieves the top *N* number of attributes, where *N* is the number specified by the **Max Context Data Item to Show** property. The attributes are shown in the selected symbol type.

If a matching asset is not found in the AF server, no data is shown and a message is provided in the System Platform logger.

If the **Data Items** property is configured, those data items are shown together with the context-driven attributes. The Data Items property can include data items from multiple databases from either the same AF server or a different AF server.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

The connection to the Context Asset Server uses the Windows credential of the currently logged-in user.

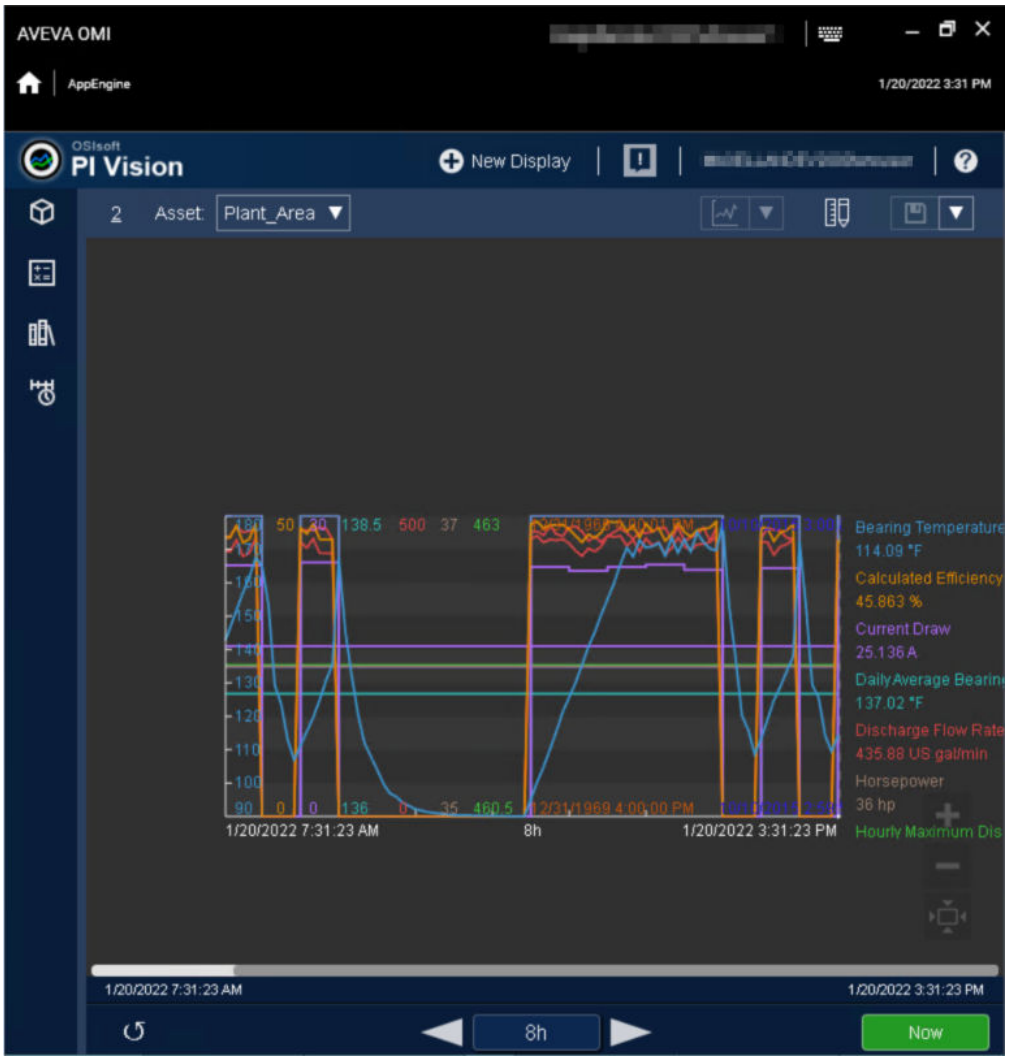
### To contextualize Ad Hoc Displays

1. Enable the **Follow Current Context** property. When **Follow Current Context** is enabled, you can provide entries for the following properties:
   - **Context Asset Server**. This property specifies an asset server in your PI system that will be used to get the current context. If you do not enter the server name, the PI Vision OMI app will try to connect to the default asset server. The PI Vision OMI app will use the credentials of the currently logged-in Windows user to connect to the asset server.
   - **Context Asset Database:** This property names the asset database to retrieve from the specified Context Asset Server, and is used to get the attributes from the currently-selected asset. If a database is not specified, the PI Vision OMI app will attempt to discover the selected asset from the default database of Context Asset Server (if specified). If the Context Asset Server is not specified, it will make the attempt from the default asset server.
2. Set the **Max Context Data Items to Show** parameter to the number of data items that should be shown from the selected asset. We recommend that you show no more than 10 to ensure good performance.

   The **Follow Current Context** property will auto-discover the given number of attributes for the selected asset. The attributes of the selected asset are retrieved from the PI Vision AF server and shown in the selected type of symbol at run time. If there is no matching asset found in the AF server, no data is shown, and a message is sent to the System Platform logger.

In addition to contextual data items, you can show data items for other assets, regardless of the current context. These additional data items do not impact the **Max Context Data Items to Show** property, and do not change as the context changes.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




## PI Vision OMI App Scripting

The PI Vision app lets you script many of the PI Vision properties. Scripts that incorporate methods and their parameters as well as PI Vision app properties are supported. Script statements can be specified using the MyContent Namespace format in layout scripting by the following syntax formats:

MyContent.*name of the PI Vision App instance*.*PIVisionApp_Method*(parameter_1, parameter_2, parameter_n);

or

MyContent.*name of the PIVision App instance*.*PIVisionApp_Property* = xxx

### Scripting Methods

The PI Vision OMI App includes the **Refresh()** scripting method for layout scripts.

### PI Vision OMI App Properties in Layout Scripts

The following table lists PI Vision OMI App properties as they appear in the **Properties** page of Layout and ViewApp editors and how they are specified in layout scripting. Notice that property names in layout scripting are single words without blank spaces.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- **Property Names:** In most cases, with the exception of **Max Context DataItems to Show**, the scriptable property name is identical to the property name as shown in the Properties page.
- **Layout Scripts:** All properties, with the exception of **Symbol Type**, are scriptable in layout scripts.
- **Bindable Properties:** All properties, with the exception of Symbol Type, can be configured in the property grid to be bindable at run time.

| PI Vision App Properties | Layout Script Editor | Scriptable | Bindable |
|---|---|---|---|
| Web Server | WebServer | yes | yes |
| Web Site | WebSite | yes | yes |
| View Dashboard Display | ViewDashboardDisplay | yes | yes |
| Dashboard ID | DashboardID | yes | yes |
| Asset Path | AssetPath | yes | yes |
| View Ad hoc Display | ViewAdhocDisplay | yes | yes |
| Context Asset Server | ContextAssetServer | yes | yes |
| Context Asset Database | ContextAssetDatabase | yes | yes |
| Data Items | DataItems | yes | yes |
| Symbol Type | SymbolType | NO | NO |
| Start Time | StartTime | yes | yes |
| End Time | EndTime | yes | yes |
| Follow Current Context | FollowCurrentContext | yes | yes |
| Max Context DataItems to Show | MaxContextDataItemsCount | yes | yes |
| View Display URL | ViewDisplayURL | yes | yes |
| Display URL Parameters | DisplayURLParameters | yes | yes |
| Hide Toolbar | HideToolbar | yes | yes |
| Hide Sidebar | HideSibebar | yes | yes |
| Kiosk Mode | KioskMode | yes | yes |
| Style Sheet | StyleSheet | yes | yes |

## Event Scripting

The following event is exposed for scripting:

PIVisionLoaded: This notifies the app that display has finished loading.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# PI Vision OMI App Property Validation

The properties listed in the PI Vision OMI App property grid are validated during design time to ensure proper configuration.

For most of the properties, design time validation occurs only when the property value is modified in the property grid. If the property is not modified in the property grid, validation will occur when the ViewApp is deployed to run time. Values entered for properties are checked, and if the required minimum configuration is not met, an visual cue indicating the error is shown in the app, and details of the error are sent to the System Platform Logger.

The following is a summary of property validation.

| **Property Name** | **Type** | **Validation** |
|---|---|---|
| Web Server | string | Cannot be empty; no spaces in name |
| Web Site | string | Cannot be empty; no spaces in name |
| View Dashboard Display | Boolean | Can only be true when ad hoc and freeform display modes are false |
| Dashboard ID | integer | Must be > 0 when View Dashboard Display is true. Must = 0 when View Dashboard Display or View Freeform Display is true. |
| Asset Path | string | Optional, not validated |
| View Ad hoc Display | Boolean | Can only be true when dashboard and freeform display modes are false |
| Data Items | string | Optional, not validated |
| Context Asset Server | string | Optional, not validated |
| Context Asset Database | string | Optional, not validated |
| Follow Current Context | Boolean | Can only be true when either dashboard or ad hoc display mode is true |
| View Display URL | Boolean | Can only be true when dashboard and ad hoc display modes are false |
| Display URL Parameters | string | Can only be set when View Display URL is true |
| Start Time | string | Optional. If Start Time is provided, End Time must also be provided |
| End Time | string | Optional. If End Time is provided, Start Time must also be provided |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Using the PI Vision OMI App During Runtime

The applicable SSL certificate must be installed on the run time node that is running the PI Vision OMI App. See SSL Certificate for Run-Time Nodes for more information.

If an invalid app property value is detected when the ViewApp containing the PI Vision OMI App starts, an error icon appears in the pane containing the app. The ViewApp continues running, but the pane containing the app will show only the error icon.




One or more error messages appear in the System Management Console logger with descriptions of any problems.

### SSL Exceptions

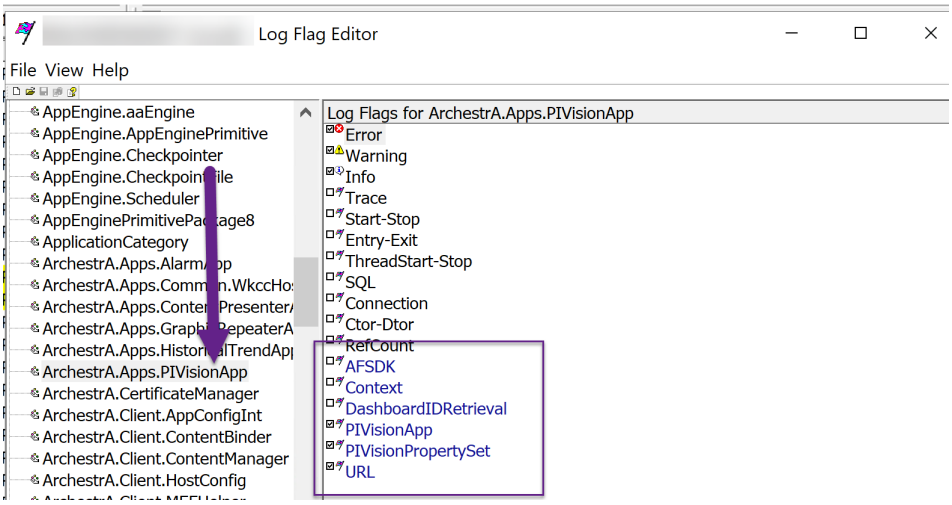
If an SSL certificate is not configured, using the PI Vision OMI App for Dashboard displays in context mode will fail and result into SSL Exception.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Troubleshooting

The PI Vision OMI App utilizes the following custom log flags within the AVEVA Log Flag Editor, to facilitate troubleshooting:

- AFSDK
- Context
- DashboardIDRetrieval
- PIVisionAPP
- PIVisionPropertySet
- URL




Of the custom flags applicable to the PI Vision OMI App, **URL** is the most significant, and can be used to troubleshoot issues related to display loading. When enabled, this flag shows the URL that will be formed, based on the configuration that was set in the app.

As the PI Vision OMI App is essentially a wrapper around the PI Vision product, this URL flag can be used to expose and diagnose the display issue that you may be seeing in the PI Vision OMI App.

To identify if the issue is on the OMI side or PI Vision side, copy the URL, as shown in the System Platform logger view, and paste it in your standard browser. The behavior of the PI Vision display in the browser with the given URL parameters/values should match the behavior seen in the OMI app, if the issue is on the PI Vision side.

If the problem is identified on the PI Vision side, we recommend that you contact Osisoft – PI vision customer support. Once the problem is fixed in PI Vision, the PI vision OMI App for will start working and displaying the expected behavior.

Although many URL parameters can be changed while the application is running, PI Vision does not officially support URL parameters as a run-time setting. This means that the parameters are intended to be used in the URL that opens the application, but not to modify the running application. To the end user, this means that some parameter changes will require either a browser refresh or to reload the app in a new tab.

Having said that, many parameters will work correctly at run-time. If you encounter a parameter that is not working the way you think it should, and it is causing an issue at run time, use the custom flag **URL** to verify if the

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

same behavior is also seen in the standard browser. Based on the results, you may need to contact customer support or upgrade your PI Vision application server.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Upgrade and Migration of the PI Vision OMI App

The PI Vision OMI App can be downloaded from AVEVA product website and then imported into AVEVA System Platform 2020 R2 SP1. The *AVEVA PI Vision OMI App Readme* includes instructions for importing the app into System Platform 2020 R2 SP1.

- The PI Vision OMI App is targeted for System Platform 2020 R2 SP1.
- The PI Vision OMI App can be migrated to subsequent versions of System Platform as they become available.
- Users can export the PI Vision OMI App to an .aaPKG file and then import the aaPKG file into a future release of System Platform.

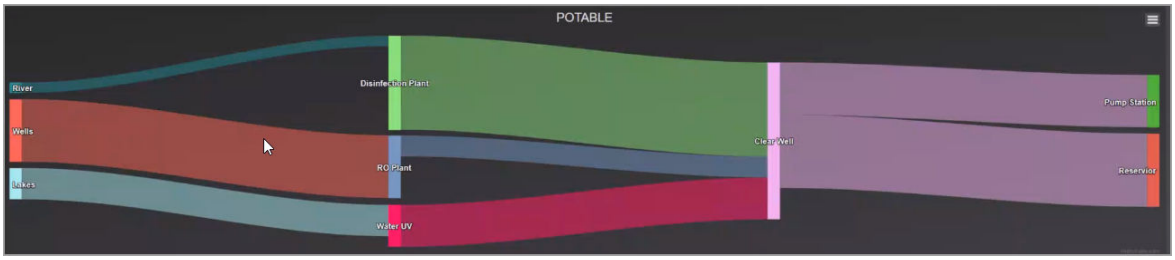
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Chapter 12 Sankey Diagram App - Flex License Only

**Note:** The AVEVA Sankey Diagram OMI App requires an AVEVA Flex license. It is not included in the product installation. If you have a Flex license, see Downloading and Installing the Sankey Diagram App for installation instructions

A Sankey chart is a flow diagram that shows nodes linked by flows, the quantity of each flow being represented by its width. This chart type emphasizes the major transfers or flows within a system and helps to locate dominant contributions to an overall flow.

In the following example, the volume of water traveling through a water system from source to distribution is displayed. The wider lines indicate larger volumes.




### Understanding Sankey Diagram Data Structure

**Nodes** (horizontal) define the number of organizational categories needed to describe all flows being considered. Typically, the number of levels required is determined by a system's organizational hierarchy. In the above example, the Drinking Water (Potable) Service is organized into four Water Systems (Nodes), including source, treatment, storage and distribution water systems.

**Levels** (vertical) are the boxes that the items or other measures flow between. In the example above, the Level for each water system type are defined by the number of process categories included for each water system. The Level defined in the example above is described in the following table:

| Node (Water System Type) | Level (Process Type) |
|---|---|
| Source | River<br>Wells<br>Lakes |
| Treatment | Filtration Plant<br>Disinfection Plant<br>Reverse Osmosis (RO) Plant<br>Ultra Violet (UV) Plant |
| Storage | Clear Wells |
| Distribution | Reservoir<br>Pump Station<br>Leak Index |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

**Mappings** are the bands visualizing the flow itself. A single **Node** can be assigned multiple **Mappings**. Each **Mapping** has three parameters, a **Start Node**, **End Node** and **Value**. The **Value** determines the weight of the band linking start and end nodes. **Value** is defined using the **Reference** field. The **Reference** field consists of a reference to an Operations Management Interface (OMI) data point (for example, flow). Using the example above, each **Node** might be assigned the following parameters:

| **Mapping** | |
|---|---|
| **Start Node** | **End Node** |
| River | Filtration |
| Wells | RO Plant |
| Wells | UV Plant |
| Lakes | Disinfection |
| Filtration Plant | Clear Wells |
| Disinfection Plant | Clear Wells |
| RO Plant | Clear Wells |
| UV Plant | Clear Wells |
| Clear Wells | Reservoir |
| Clear Wells | Pump Station |

## Downloading and Installing the Sankey Diagram App

If you have an AVEVA Flex license, you can download the Sankey Diagram app from the AVEVA Product Hub, then install it. Follow the instructions below.

### Prerequisites

Before you install the Sankey Diagram App, you need to install and configure:

1. System Platform version 2020 R2 SP1 or later.

   For more information, please refer to the *System Platform Installation Guide.*

2. A valid Flex License for System Platform.

   For more information, please refer to the *AVEVA Enterprise License Manager User Guide.*

### To download the Sankey Diagram app

1. Open the System Platform IDE.
2. From the **Home** ribbon, select **Galaxy**, then **Import**.
3. Select **Objects**,then **Explore product hub**.

   **Note:** You can also go directly to the Product Hub using this URL: https://softwaresupportsp.aveva.com/#/producthub

4. On the Product Hub, for **Product**, select **System Platform**.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

5. For the **Download Type**, select **Add On**.
6. From the list, select the Sankey Diagram app.

The app is downloaded as a .zip file which includes a .aaPKG file containing the app itself, a PDF User Guide for the app, and an HTML ReadMe file with additional information.

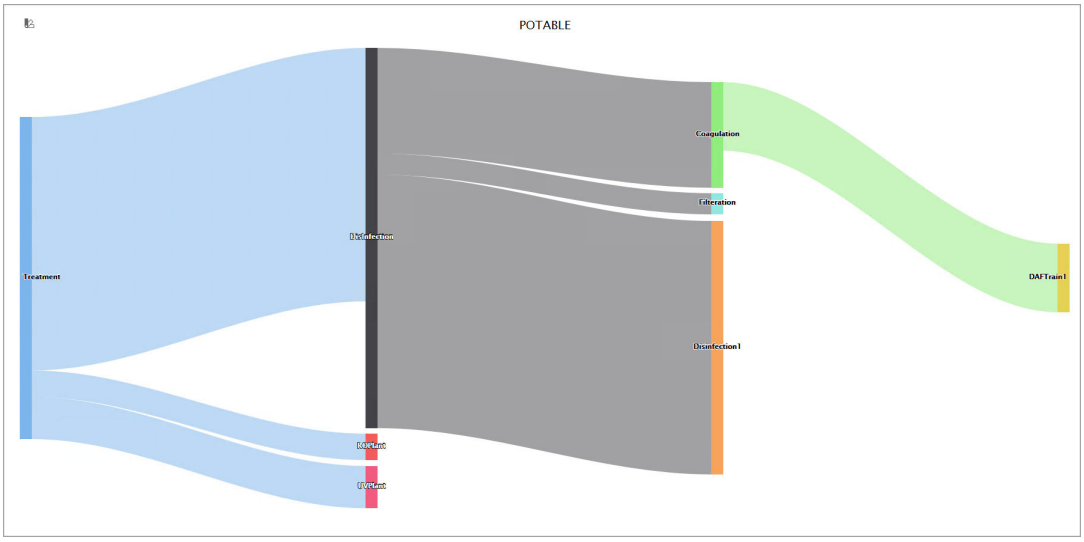
**To install the Sankey Diagram app**

1. Extract all files from the downloaded zip file. Select a destination folder that is accessible from the System Platform IDE.
2. In the System Platform IDE, from the **Home** ribbon, select **Galaxy**, then **Import**.
3. Select **Objects**, then **From package**.
4. Browse to the location of the extracted .aaPKG file, select the file, and select **Open**.
5. On the **Import preferences** dialog box, leave the default selections and select **Import**.

This imports the application at the root level of the Visualization folder. You can drag it to any desired location in the Visualization folder.

## Changing the Sankey Diagram Display Theme

Modify the Display Theme for a Sankey chart by selecting a theme from the available preconfigured list.

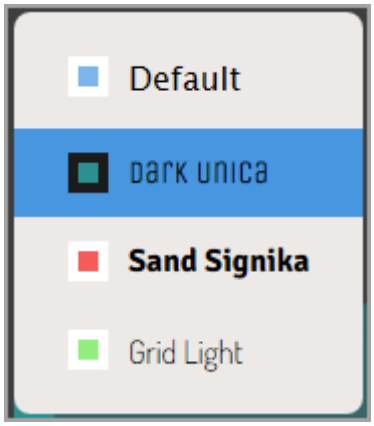



**To change the Sankey Chart display theme**

1. In the Sankey diagram of interest, click  .

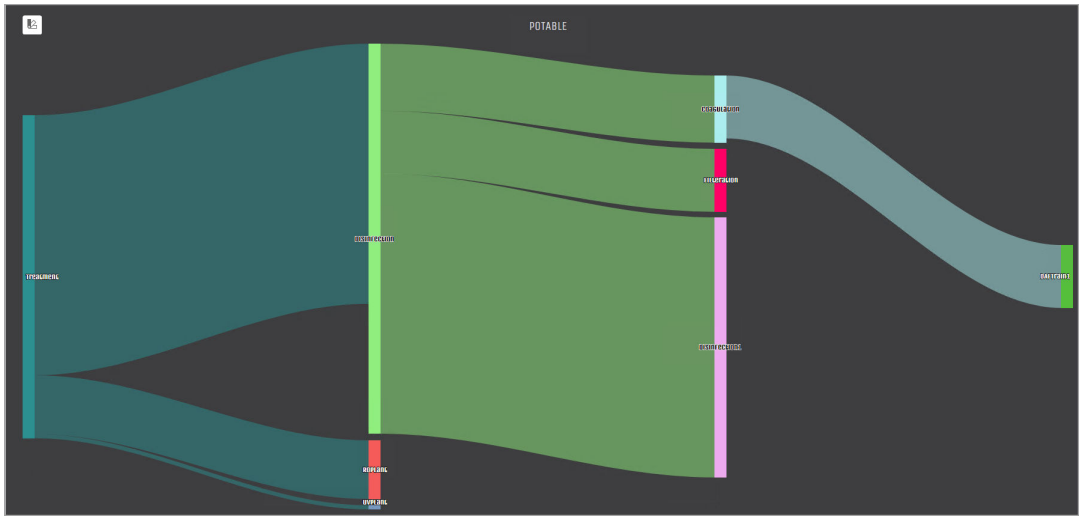
   The Display Theme menu appears.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




2. Select the theme from the available items.

   The Sankey chart updates to the selected theme.




## Working with Sankey Diagrams

Browse Sankey charts to view the major transfers or flows within a system and locate dominant contributions to an overall flow in real-time.

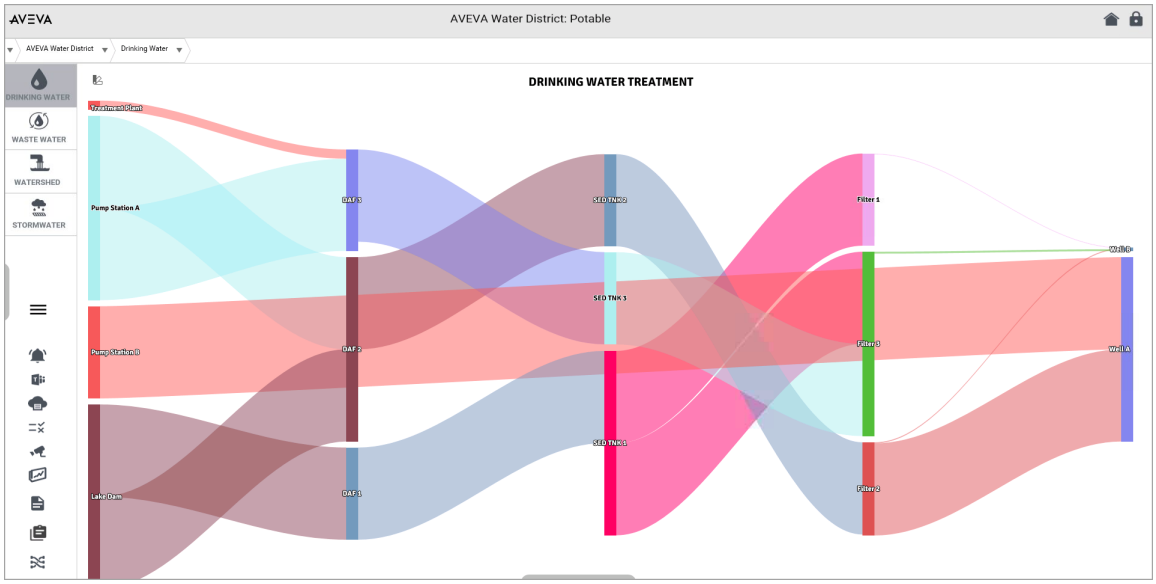
**Note:** Process Overviews must be configured to display context-specific Sankey information. For more information on configuring Sankey charts for Process Overviews, refer to the *UOC for Water Installation and Configuration Guide*.

**To access Sankey Charts**

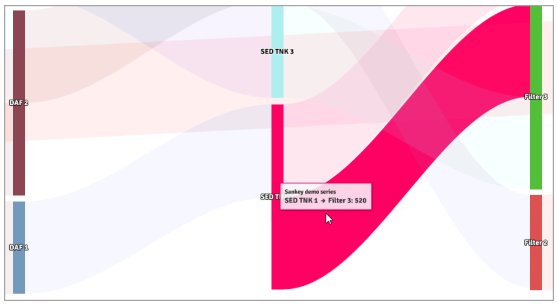
- On the Application toolbar, click .

  The Sankey Charts tool opens for the active organizational unit.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




Hover the cursor over a given flow to view detailed information related to that flow. The start and end nodes and current flow are displayed.




© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Configuring Sankey Diagram OMI App

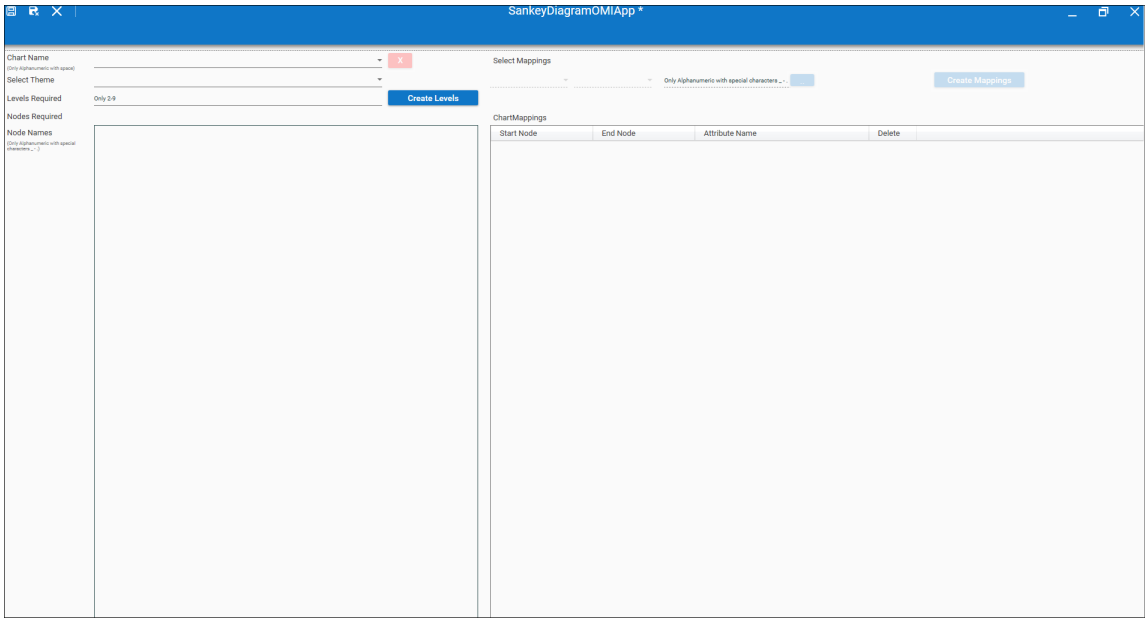
The topics in this section describe:

- Creating a new Sankey chart
- Adding the Sankey Diagram OMI App to an OMI layout
- Adding a layout containing the Sankey Diagram OMI App to a ViewApp
- Displaying the Sankey chart in runtime

## Creating a New Chart on Sankey Diagram OMI App

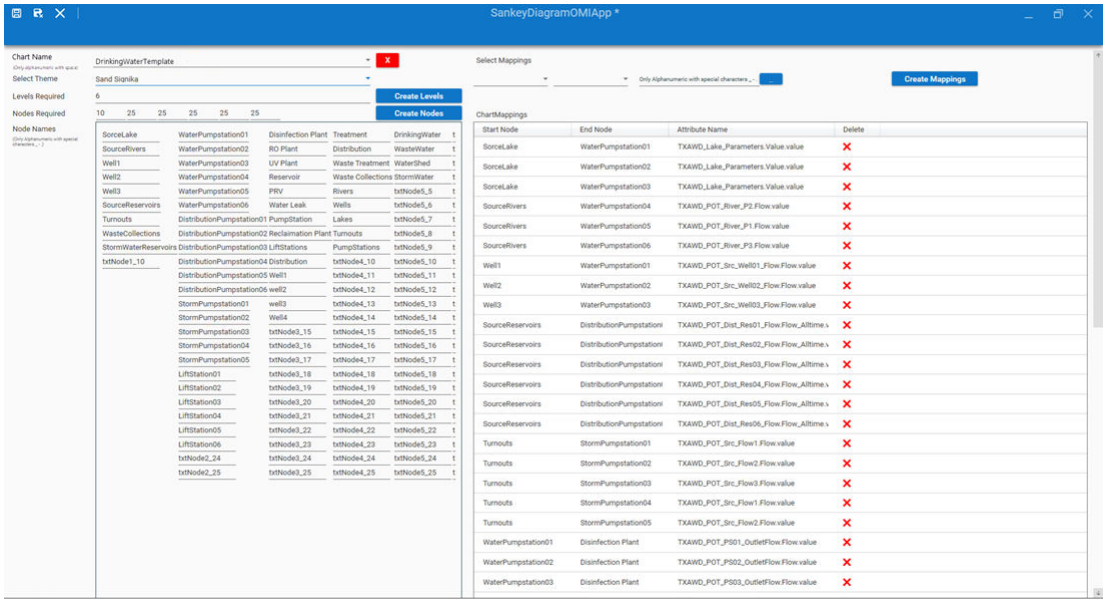
**To create a new chart in Sankey Diagram OMI App:**

1. Double click Sankey Diagram OMI App to open Sankey Diagram OMI App Editor.
2. Click **OK** to open the Sankey Diagram OMI App Editor.
3. In the **Chart Name** field, enter the new chart name.
4. In the **Select Theme** field, choose the theme.
5. In the **Levels Required** field, enter number of chart levels required from 1 to 9, then click **Create Levels**.




6. In the **Nodes Required** field, enter the numbers of nodes required, then click **Create Nodes**.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




7. Edit or update the node names as desired. You will use these node names in the chart mappings.
8. Create the chart mappings. For each mapping:
   a. Select the start and end nodes.
   b. Browse to and select the object (such as a flow meter between the two nodes) and attribute that measures the flow that you want this band to represent.

## Adding Sankey Diagram OMI App to a Layout

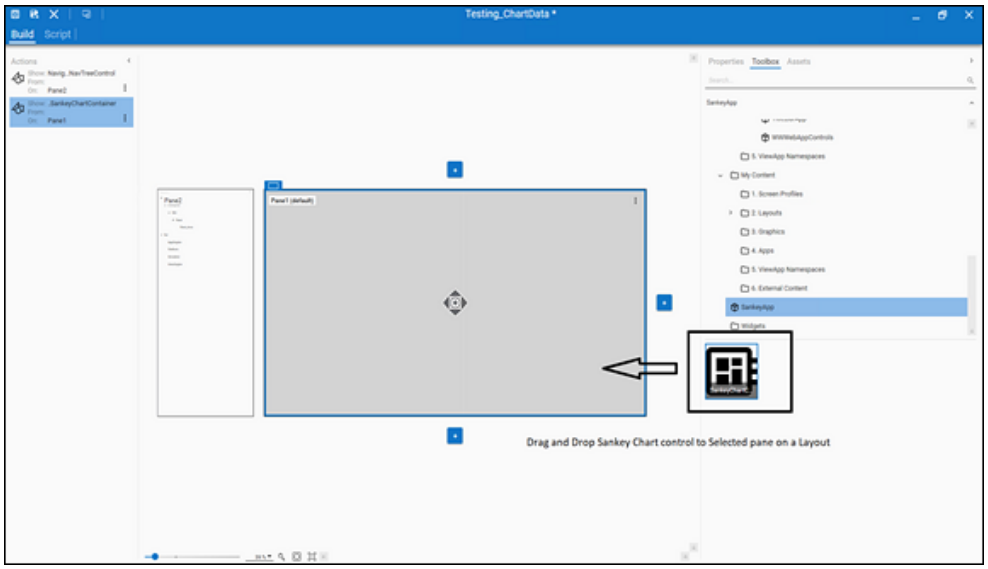
**To add the Sankey Diagram OMI App to a layout:**

After the charts are created on Sankey Diagram OMI App, configure the chart to the layout.

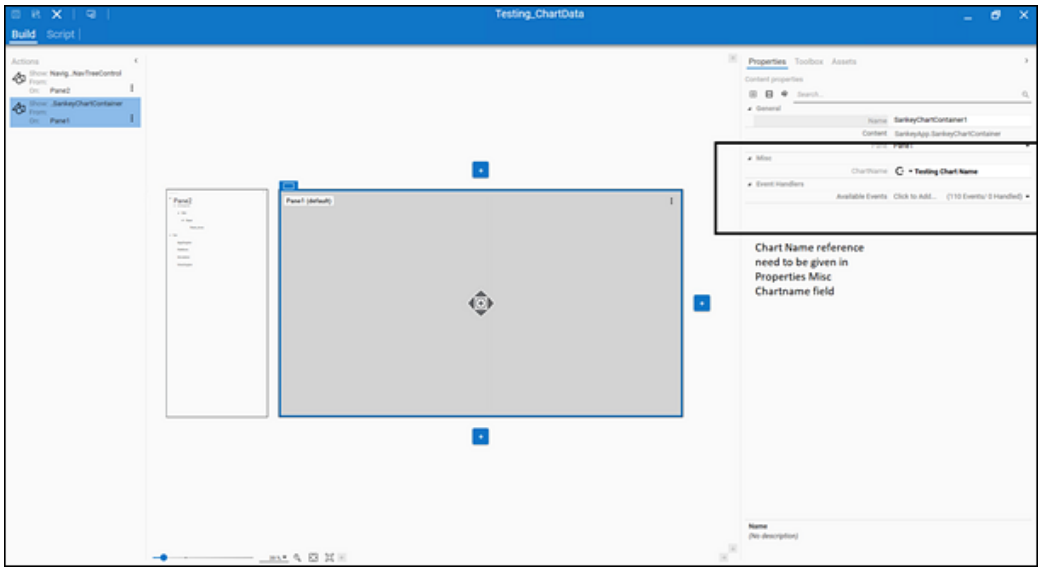
1. Open the **Visualization folder.**
2. Right-click the Galaxy name.
3. Select **New.**
4. Click **Layout** to create a new layout.
5. Double-click the layout to edit a layout, create new layout, or to create more panes as needed.
6. Select **Toolbox,** then select **Sankey Diagram OMI App** from the list.
7. Drag and drop the selected app to pane.

   A Sankey Diagram OMI App is added to the pane.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




8. Click **Properties** and add chart reference details at Misc., Chart Name.
9. Save and close the layout.




The Sankey Diagram OMI App is successfully added to the layout.

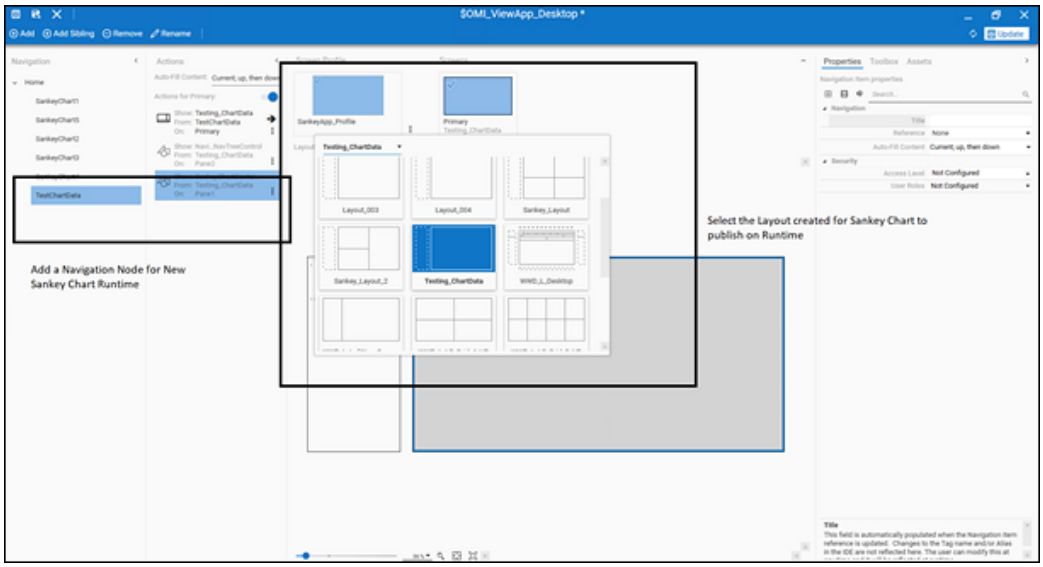
## Adding Layout to View App

**To add Sankey Diagram OMI App Layout to the ViewApp:**

1. Double click **OMI Viewapp.**
2. Create a navigation item for Sankey App, by selecting an existing **Node** or **Home** on Viewapp.
3. Click **Add.**
4. Provide a name to the node and select the layout created for Sankey App.
5. Save the configurations and deploy the ViewApp.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

6. Click on **Preview** to see Sankey Diagram OMI App functionality.




## Displaying Sankey Chart in Runtime

**To Deploy View App to runtime:**

1. Open Deployment View of the galaxy.
2. Select the **View App**, where Sankey charts and its layout are added.
3. Right click on View App and select **Deploy.**

   The **Deploy** window appears.
4. Retain the default settings, and then click **OK**.

   View App is successfully deployed to OMI Runtime.

**To Open OMI Runtime screens:**

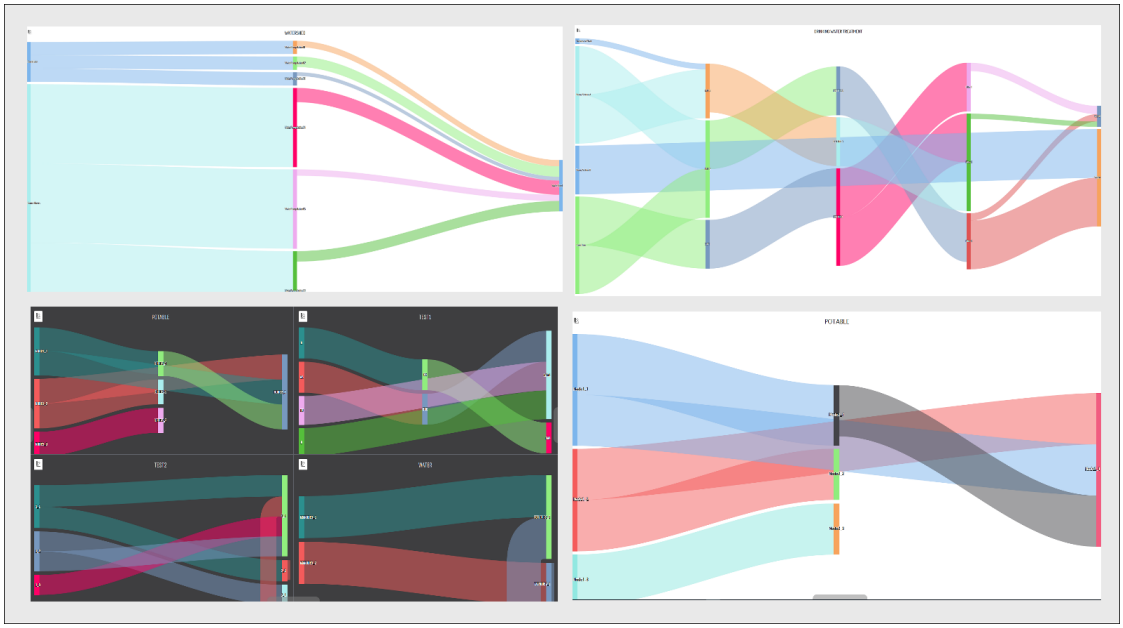
1. Click **AVEVA OMI Application Manager** icon on the desktop.

   A window opens with all deployed View Applications to OMI.
2. Choose the right View App deployed earlier, and then click **Launch.**

   The **AVEVA Operations Management Interface** opens and displays the applications.
3. Click **Slide** in the pane to navigate to the desired Sankey chart, and then select the one which was created by the user.

   Now the user can see the Sankey chart with data and values.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.



User can select any mapping between nodes. Placing the pointer on mapping shows a Tool Tip with Value and details of the mappings.

**Note:** A stable internet connection is a prerequisite for Sankey Charts.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Scheduler App - Flex License Only

**Note:** The AVEVA Scheduler OMI App requires an AVEVA Flex license. It is not included in the product installation. If you have a Flex license, see Downloading and Installing the Scheduler App for installation instructions.

The AVEVA Scheduler application automates the scheduling process parameters of any subsystem, such as a Street Lighting or Integrated Building Management System (IBMS). The administrator can configure operational schedules for any subsystem. The following are the two components of the Scheduler:

- Scheduler Application
- Scheduler Object

The two components are synchronized during the runtime.

## Prerequisites

Make sure you have installed and configured System Platform version 17.0.000 or higher on the computer where you are going to install the AVEVA™ *Scheduler* application.

For more information, refer to *System Platform Installation Guide*.

## Downloading and Installing the Scheduler App

If you have an AVEVA Flex license, you can download the Scheduler app from the AVEVA Product Hub, then install it. Follow the procedures below.

**To download the Scheduler app**

1. Open the System Platform IDE.
2. From the **Home** ribbon, select **Galaxy**, then **Import**.
3. Select **Objects**,then **Explore product hub**.

   **Note:** You can also go directly to the Product Hub using this URL: https://softwaresupportsp.aveva.com/#/producthub
4. On the Product Hub, for **Product**, select **System Platform**.
5. For the **Download Type**, select **Add On**.
6. From the list, select the Scheduler app.

The app is downloaded as a .zip file which includes two .aaPKG file containing the app itself and a template object to use to configure it, a PDF User Guide for the app, and an HTML ReadMe file with additional information.

**To install the Scheduler App and Template Object**

1. Extract all files from the downloaded zip file. Select a destination folder that is accessible from the System Platform IDE.
2. In the System Platform IDE, from the **Home** ribbon, select **Galaxy**, then **Import**.
3. Select **Objects**, then **From package**.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

4. Browse to the location of the **SchedulerApp.aaPKG** file, select the file, and select **Open**.
5. On the **Import preferences** dialog box, leave the default selections and select **Import**.

   This imports the application at the root level of the Visualization folder. You can drag it to any desired location in the Visualization folder.
6. Again, from the **Home** ribbon, select **Galaxy**, then **Import**.
7. Select **Objects**, then **From package**.
8. Browse to the location of the **$SchedulerObject.aaPKG** file containing the template object, select the file, and select **Open**.
9. On the **Import preferences** dialog box, leave the default selections and select **Import**.

   This imports the template into the Application folder in the Template folder. You can drag it to any desired location in the folder.

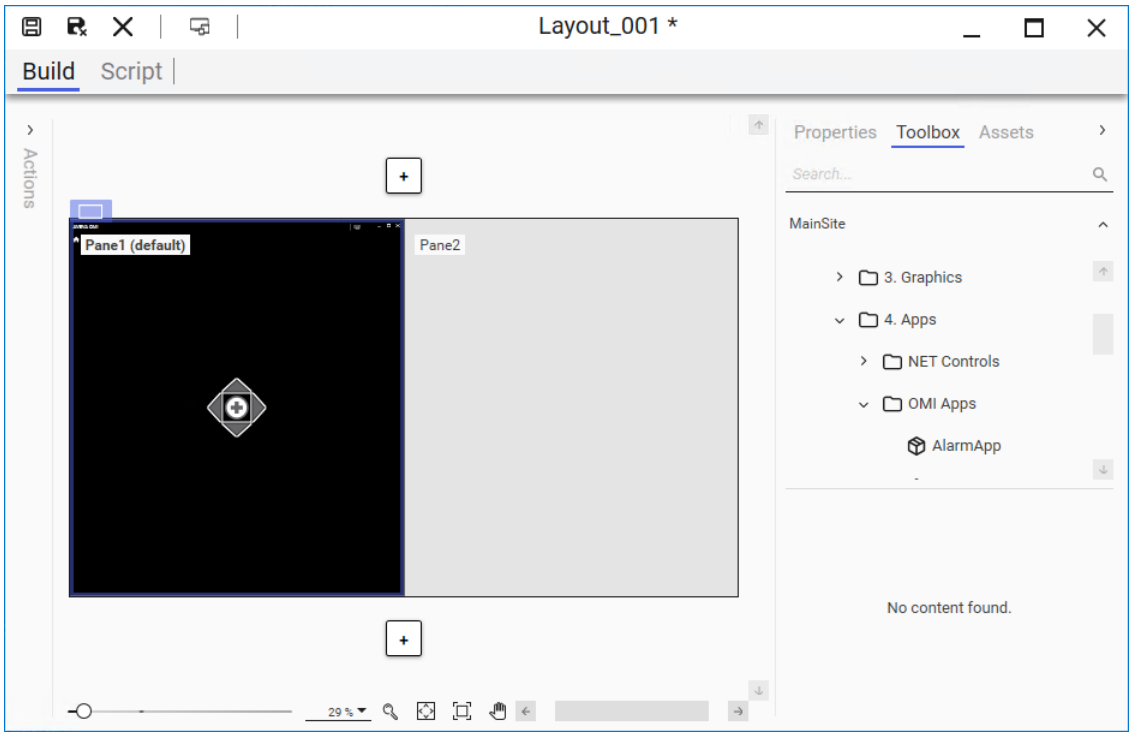
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Configuring the Scheduler Application

Configure the application to apply a process parameter and automate a schedule.

**To configure the application:**

1. Create a layout in the OMI application.




2. Add the Scheduler app to one of the panes in the layout.
3. Click the **Properties** tab and then customize the properties.

   For more information, refer to Customizing the General Properties.

## Configuring the Properties

You should configure the following properties as required:

- General
- Configuration Files
- Security
- User Interface
- Appearance
- Layout

### Customizing the General Properties

You can customize the text displayed on each pane.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

**To customize the general properties:**

- Select the pane from the **Pane** drop-down menu.

  The **Content** field is auto-generated. This content appears on the selected pane.

## Configuring the Path for Configuration Files

XML configuration files store information for the schedules you configure in the application. The runtime scheduler will create the XML files in the paths you define here when you preview or deploy and launch the application that contains the Scheduler app.

**To configure the path for configuration files:**

- Enter the file paths to the following properties:

| | |
|---|---|
| **ConfigurationFileName**<br>  | To set the path for the **ConfigurationFileName** .xml file.<br>You can enter the path in the text box. |
| **HolidayWeekendFileName**<br>  | To set the path for the **HolidayWeekendFileName** .xml file.<br>You can enter the path in the text box. |
| **SubSystemFileName**<br>  | To set the path for the **SubSystemFileName** .xml file.<br>You can enter the path in the text box. |
| **TimePeriodFileName**<br>  | To set the path for the **TimePeriodFileName** .xml file.<br>You can enter the path in the text box. |
| **ZoneFileName**<br>  | To set the path for the **ZoneFileName** .xml file.<br>You can enter the path in the text box. |

## Customizing the Appearance

You can customize the font, color and appearance of the user interface.

**To customize the appearance:**

- Customize the following properties:

| | |
|---|---|
| **BorderBrush** | To customize the color of the Border of the Scheduler application.<br>You can select the color on the color picker from the drop-down menu. |
| **BorderThickness** | To customize the border thickness of the border.<br>You can click the text box to enter the value. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| **Background** | To customize the color of the background of all the tabs and their sub-controls, and dialog boxes of the *Scheduler* application.<br>You can select the color on the color picker from the drop-down menu. |
| **Foreground** | To customize the color of the font that appears on all the tabs and their sub-controls, and dialog boxes of the *Scheduler* application.<br>You can select the color on the color picker from the drop-down menu. |
| **FontFamily** | To customize the font that appears on all the tabs and their sub-controls, and dialog boxes of the *Scheduler* application.<br>You can select the font from the drop-down menu. |
| **FontSize** | To customize the size of the font that appears on all the tabs and their sub-controls, and dialog boxes of the Scheduler application.<br>You can click the text box to enter the font size. |
| **FontStretch** | To customize the font that appears on all the tabs and their sub-controls, and dialog boxes of the *Scheduler* application.<br>You can select the font from the drop-down menu. |
| **FontStyle** | To customize the font stylr that appears on all the tabs and their sub-controls, and dialog boxes of the *Scheduler* application.<br>You can click the text box and enter of the following values: Normal, Italic and Oblique. |
| **FontWeight** | To customize the font stylr that appears on all the tabs and their sub-controls, and dialog boxes of the *Scheduler* application.<br>You can click the text box and enter a value from 100 to 900. |

### Customizing the Layout

You can customize the alignment and padding of the user interface.

**To customize the layout:**

- Customize the following properties:

| | |
|---|---|
| **HorizontalContentAlignment** | To customize the horizontal alignment of the content of the Scheduler application.<br>You can select an option from the drop-down menu. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| **VerticalContentAlignment** | To customize the vertical alignment of the content of the Scheduler application.<br>You can select an option from the drop-down menu. |
| **Padding** | To customize the padding for the content of the *Scheduler* application.<br>You can click the text box and enter the value. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Configuring the Scheduler Object

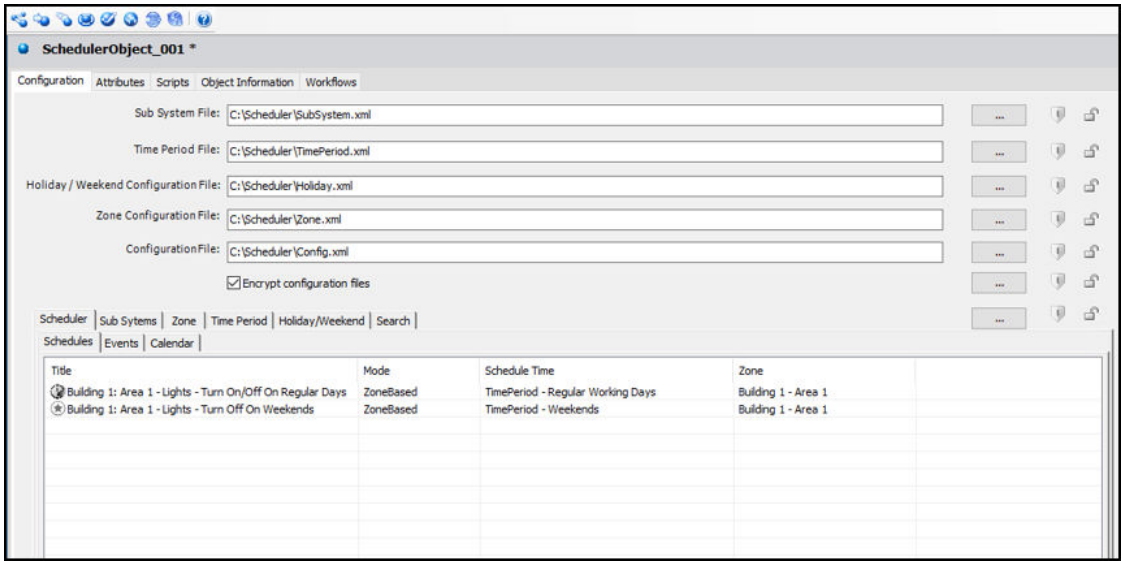
You should configure an object to automate a schedule for any subsystem.

**To configure an object:**

1. In the **Template** pane, open the **Application** folder.
2. Right-click **$SchedulerObject**. Select **New**, then **Instance** to create an instance of the Scheduler.
3. Rename the instance if desired.
4. Double-click the instance to edit it.
5. Enter the paths of the .xml files.

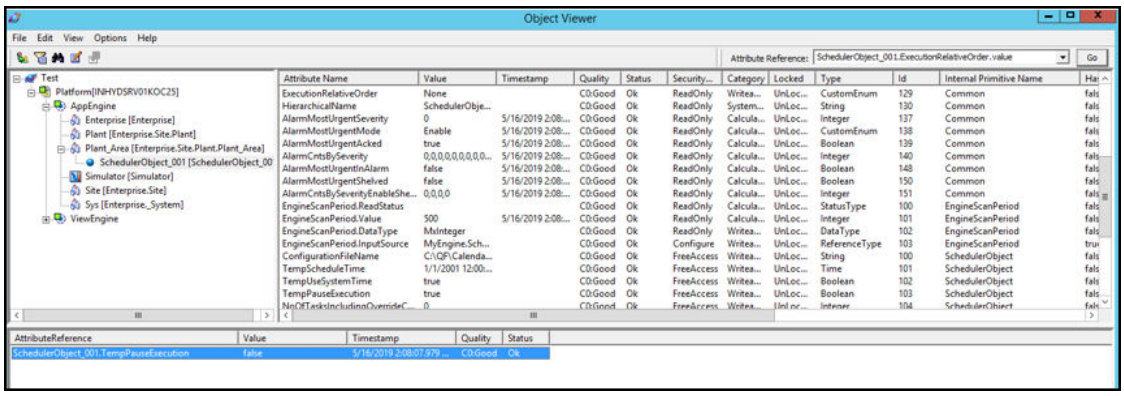
   These paths should be the same paths provided while configuring the Scheduler application.
6. Select the **Encrypt configuration files** check box.

   Ensure that the **Encrypt configuration files** check box is selected in the Scheduler application.

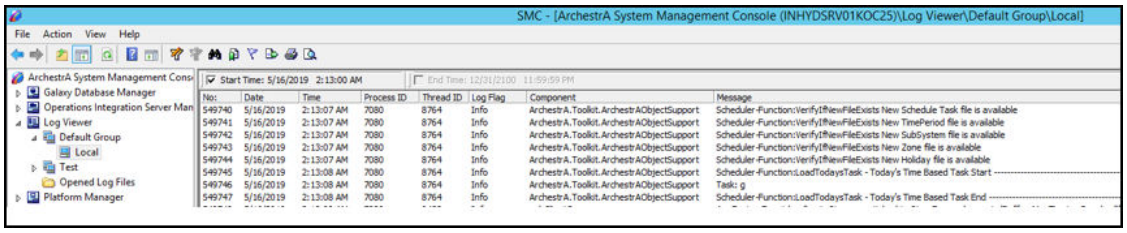



7. Assign an object to an area and then deploy the object.
8. Open the object viewer.
9. Change the value of the "*TempPauseExecution*" attribute to *false*

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




You can view all the created schedules in the logger.




**Note**: You should deploy the "*runtime*" scheduler object to activate the runtime for the object.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Runtime Configuration

After you open the Scheduler application in Operations Management Interface (OMI), you can perform the following tasks in runtime configuration:

- Adding a schedule
- Overriding a schedule
- Updating a schedule
- Deleting a schedule

## Configuring Holiday / Weekend Schedule

You can configure a holiday/ weekend schedule to reflect in the KPIs.

**To configure a holiday / weekend schedule:**

1. Open the *Scheduler* application in OMI.
2. Select the **Holiday/Weekend** tab.
3. Right-click at any point on the grid and then click **Add**.

   The **Add Holiday/Weekend** dialog box appears.
4. Enter the **Title** and **Name**.
5. Select the **Year** and then select the **Month** from the drop-down menus.
6. Select the holiday/weekend days.

   You can select or unselect all the days. You can also select specific weekdays across the month.
7. Click **Add Selected**.

   The selected days appear in the grid.

   You can add any specific day for the entire year by selecting the day from the drop-down menu.
8. Click **Save**.

   The holiday / weekend schedule is successfully configured.

**Updating a Holiday/Weekend Schedule**

**To update a holiday/weekend schedule:**

1. Double-click a holiday/weekend schedule.

   The **Update Holiday/Weekend** dialog box appears.
2. Update the information.
3. Click **Save**.

**Deleting a Holiday/Weekend Schedule**

**To delete a holiday/weekend schedule:**

- Right-click a holiday/weekend schedule and then click **Delete**.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

## Configuring Time Period

You can configure a time period to reflect in the KPIs.

**To configure the time period:**

1. Open the *Scheduler* application in OMI.
2. Select the **Time Period** tab.
3. Right-click at any point on the grid and then click **Add**.

   The **Add Time Period** dialog box appears.
4. Enter **Title**.
5. Enter the **Period Name**.
6. Select **Start Time** and **End Time**.

   You can select **Rest of the Time** and then enter a different **Period Name** to define the schedule outside the selected time slot.

   The selected time periods appear in the grid.
7. Click **Save**.

   The saved time period appears in the grid.

**Updating a Time Period**

**To update a time period:**

1. Double-click a time period.

   The **Update Time Period** dialog box appears.
2. Update the information.
3. Click **Save**.

**Deleting a Time Period**

**To delete a time period:**

- Right-click a time period and then click **Delete**.

## Configuring Subsystems

You can configure a subsystem to reflect in the KPIs.

**To configure a subsystem:**

1. Open the *Scheduler* application in OMI.
2. Select the **Sub Systems** tab.
3. Right-click at any point on the grid and then click **Add**.

   The **Add Sub Systems** dialog box appears.
4. Enter the **Main Sub System** name.
5. Enter **Facility Type**.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

6. Enter **Facility**.
7. Add the subsystem attributes information in the **Attributes** grid.
8. Add the subsystem information in the **Subsystem** grid.
9. Click **Save**.

   The subsystem is successfully configured.

### Updating a Subsystem

### To update a subsystem:

1. Double-click a subsystem.

   The **Update Subsystem** dialog box appears.
2. Update the information.
3. Click **Save**.

### Deleting a Subsystem

### To delete a subsystem:

- Right-click a subsystem and then click **Delete**.

---

**Note**: You have to enter the *Owning* object information of sub system on the grid. During runtime, the scheduler uses the attribute "*owningobject.attributename*".

---

## Configuring Zones

You can configure a zone and map it to a subsystem to reflect in the KPIs.

### To configure a zone:

1. Open the *Scheduler* application in OMI.
2. Select the **Zones** tab.
3. Right-click at any point on the grid and then click **Add**.

   The **Add Zones** dialog box appears.
4. Enter **Title**.
5. Select the **Show All Existing SubSystems** check box.

   All the configured subsystems appear in the **SubSystems** pane.
6. Select a subsystem.
7. Click the **>>** button to assign the selected subsystem to a zone.

   You can click **<<** button unassign a subsystem.
8. Click **Save**.

   The zone is successfully configured.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Updating a Zone

**To update a zone:**

1. Double-click a zone.

   The **Update Zone** dialog box appears.
2. Update the information.
3. Click **Save**.

### Deleting a Zone

**To delete a zone:**

- Right-click a zone and then click **Delete**.

## Configuring Schedules

You can create a schedule only for the time which is ahead of the current time. There are two types of schedules:

- **Standard Schedules**: For more information, see Configuring Standard Schedules.
- **Zone-based Schedules**: For more information, see Zone-based Schedules.

### Configuring Standard Schedules

You can configure the standard schedules, based on the following:

- **One Time** - This schedule is executed only once, when the scheduled time occurs.
- **Daily** - This schedule is executed every day, when the scheduled time occurs.
- **Weekly** - This schedule is executed, recurring on the selected day(s) of the week, when the scheduled time occurs.
- **Event** - This schedule is executed when the scheduled event occurs.

#### Configuring a One Time Schedule

You can configure a schedule to execute only once, when the scheduled time occurs.

**To configure a one-time schedule:**

1. Select the **Scheduler** tab and then select the **Schedules** tab.
2. Right-click at any point on the grid and then click **Add**.

   The **Add Schedule Task** dialog box appears.
3. Enter the **Title**.
4. Select **Standard** mode.
5. Select **One Time**.
6. Select the **Schedule Time** from the drop-down menu.
7. Click the **+** icon to add attributes.
8. Enter the process system attributes information in the **Attributes Definition** grid.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

**Note**: You should enter the complete attribute name.
Example: *Objectname.attributename* or *Hierarchyname.attributename*

9. Click **Save**.

   The one time schedule is successfully configured.

   After the one time schedule occurs, the color against the occurred schedule turns to green.

### Overriding a One Time Schedule

You can override the configured one time schedule.

### To override a one time schedule:

1. On the **Add Schedule Task** dialog box, select the **Override** check box.
2. Enter the **Attribute**.
3. Select the **Criteria** from the drop-down menu.
4. Enter the **Value**.
5. Click **Save**.

   The override condition is configured.

**Runtime**: Whenever the schedule time occurs and the configuration is reflected, you can view the schedule in the object viewer.

**Standard override condition:** The configured attributes are reflected whenever the schedule time occurs or whenever the override attribute condition occurs.

### Updating a One Time Schedule

### To update a one time schedule:

1. Double-click a one time schedule.

   The **Add Schedule Task** dialog box appears.

2. Update the information.
3. Click **Save**.

### Deleting a One Time Schedule

### To delete a one time schedule:

- Right-click a one time schedule and then click **Delete**.

#### Configuring a Daily Schedule

You can configure a schedule to execute every day, when the scheduled time occurs.

### To configure a daily schedule:

1. Select the **Scheduler** tab and then select the **Schedules** tab.
2. Right-click at any point on the grid and then click **Add**.

   The **Add Schedule Task** dialog box appears.

3. Enter the **Title**.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

4. Select the **Standard** mode.
5. Select **Daily**.
6. Select the **Schedule Time** from the drop-down menu.
7. Click the **+** icon to add attributes.
8. Enter the process system attributes information in the **Attributes Definition** grid.

   **Note**: You should enter the complete attribute name.
   Example: *Objectname.attributename* or *Hierarchyname.attributename*

9. Click **Save**.

   The daily schedule is successfully configured.

### Overriding a Daily Schedule

You can override the configured daily schedule.

### To override a daily schedule:

1. On the **Add Schedule Task** dialog box, select the **Override** check box.
2. Enter the **Attribute**.
3. Select the **Criteria** from the drop-down menu.
4. Enter the **Value**.
5. Click **Save**.

   The override condition is configured.

**Runtime**: Whenever the schedule time occurs and the configuration is reflected, you can view the schedule in the object viewer.

**Standard override condition:** The configured attributes are reflected whenever the schedule time occurs on a daily basis or whenever the override attribute condition occurs.

### Updating a Daily Schedule

### To update a daily schedule:

1. Double-click a daily schedule.

   The **Add Schedule Task** dialog box appears.

2. Update the information.
3. Click **Save**.

### Deleting a Daily Schedule

### To delete a daily schedule:

- Right-click a daily schedule and then click **Delete**.

#### Configuring a Weekly Schedule

You can configure a schedule to recur on the selected day(s) of the week, when the scheduled time occurs.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### To configure a weekly schedule:

1. Select the **Scheduler** tab and then select the **Schedules** tab.
2. Right-click at any point on the grid and then click **Add**.

   The **Add Schedule Task** dialog box appears.
3. Enter the **Title**.
4. Select the **Standard** mode.
5. Select **Weekly**.
6. Select the **Schedule Time** from the drop-down menu.
7. Select the recurrence days.
8. Click the **+** icon to add attributes.
9. Enter the process system attributes information in the **Attributes Definition** grid.

   **Note**: You should enter the complete attribute name.
   Example: *Objectname.attributename* or *Hierarchyname.attributename*
10. Click **Save**.

    The weekly schedule is successfully configured.

### Overriding a Weekly Schedule

You can override the configured weekly schedule.

### To override a weekly schedule:

1. On the **Add Schedule Task** dialog box, select the **Override** check box.
2. Enter the **Attribute**.
3. Select the **Criteria** from the drop-down menu.
4. Enter the **Value**.
5. Click **Save**.

   The override condition is configured.

**Runtime**: Whenever the schedule time occurs and the configuration is reflected, you can view the schedule in the object viewer.

**Standard override condition:** The configured attributes are reflected whenever the schedule time occurs on a weekly basis or whenever the override attribute condition occurs.

### Updating a Weekly Schedule

### To update a weekly schedule:

1. Double-click a weekly schedule.

   The **Add Schedule Task** dialog box appears.
2. Update the information.
3. Click **Save**.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Deleting a Weekly Schedule

### To delete a weekly schedule:

- Right-click a weekly schedule and then click **Delete**.

#### Configuring an Event-based Schedule

You can configure a schedule to execute when an event occurs.

### To configure an event-based schedule:

1. Select the **Scheduler** tab and then select the **Schedules** tab.
2. Right-click at any point on the grid and then click **Add**.

   The **Add Schedule Task** dialog box appears.
3. Enter the **Title**.
4. Select the **Standard** mode.
5. Select **Event**.
6. Select the **Schedule Time** from the drop-down menu.
7. Select the **Attribute**.
8. Select the **Criteria** from the drop-down menu.
9. Enter the **Value**.
10. Click the **+** icon to add attributes.
11. Enter the process system attributes information in the **Attributes Definition** grid.

    **Note**: You should enter the complete attribute name.
    Example: *Objectname.attributename* or *Hierarchyname.attributename*
12. Click **Save**.

    The event-based schedule is successfully configured.

**Runtime**: Whenever the scheduled event time occurs and the configuration is reflected, you can view the schedule in the object viewer.

### Updating an Event-based Schedule

### To update an event-based schedule:

1. Double-click an event- based schedule.

   The **Add Schedule Task** dialog box appears.
2. Update the information.
3. Click **Save**.

### Deleting an Event-based Schedule

### To delete an event-based schedule:

- Right-click an event-based schedule and then click **Delete**.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

## Zone-based Schedules

Zone -based Schedules are of two types:

- Fix Time Schedules
- Time Period Schedules

### Configuring Zone-based Fix Time Schedules

Zone-based fix time schedules are created for a particular zone for a specified, fixed time. You can configure the zone-based fix time schedules based on the following criteria:

- **One Time** - This schedule is executed only once, when the scheduled time occurs.
- **Daily** - This schedule is executed every day, when the scheduled time occurs.
- **Weekly** - This schedule is executed, recurring on the selected day(s) of the week, when the scheduled time occurs.
- **Holiday/Weekend** - This schedule is executed when the scheduled holiday/weekend occurs.

### Configuring a One Time Schedule

You can configure a schedule to execute only once, when the scheduled time occurs.

#### To configure a one-time schedule:

1. Select the **Scheduler** tab and then select the **Schedules** tab.
2. Right-click at any point on the grid and then click **Add**.

   The **Add Schedule Task** dialog box appears.
3. Enter the **Title**.
4. Select the **Zone** mode.
5. Select **One Time**.
6. Select the **Schedule Time** from the drop-down menu.
7. Select **Fix Time**.
8. Click the **+** icon to add attributes.
9. Enter the process system attributes information in the **Attributes Definition** grid.

   **Note**: You should enter the complete attribute name.
   Example: *Objectname.attributename* or *Hierarchyname.attributename*
10. Click **Save**.

    The one time schedule is successfully configured.

### Overriding a One Time Schedule

You can override the configured one time schedule.

#### To override a one time schedule:

1. On the **Add Schedule Task** dialog box, select the **Override** check box.
2. Enter the **Attribute**.
3. Select the **Criteria** from the drop-down menu.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

4. Enter the **Value**.
5. Click **Save**.

   The override condition is configured.

**Runtime**: Whenever the schedule time occurs and the configuration is reflected, you can view the schedule in the object viewer.

**Standard override condition:** The configured attributes are reflected whenever the schedule time occurs or whenever the override attribute condition occurs.

### Updating a One Time Schedule

### To update a one time schedule:

1. Double-click a one time schedule.

   The **Add Schedule Task** dialog box appears.
2. Update the information.
3. Click **Save**.

### Deleting a One Time Schedule

### To delete a one time schedule:

- Right-click a one time schedule and then click **Delete**.

## Configuring a Daily Schedule

You can configure a schedule to execute every day, when the scheduled time occurs.

### To configure a daily schedule:

1. Select the **Scheduler** tab and then select the **Schedules** tab.
2. Right-click at any point on the grid and then click **Add**.

   The **Add Schedule Task** dialog box appears.
3. Enter the **Title**.
4. Select the **Zone** mode.
5. Select **Daily**.
6. Select the **Schedule Time** from the drop-down menu.
7. Select **Fix Time**.
8. Click the **+** icon to add attributes.
9. Enter the process system attributes information in the **Attributes Definition** grid.

   **Note**: You should enter the complete attribute name.
   Example: *Objectname.attributename* or *Hierarchyname.attributename*
10. Click **Save**.

    The daily schedule is successfully configured.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Overriding a Daily Schedule

You can override the configured daily schedule.

#### To override a daily schedule:

1. On the **Add Schedule Task** dialog box, select the **Override** check box.
2. Enter the **Attribute**.
3. Select the **Criteria** from the drop-down menu.
4. Enter the **Value**.
5. Click **Save**.

   The override condition is configured.

**Runtime**: Whenever the schedule time occurs and the configuration is reflected, you can view the schedule in the object viewer.

**Standard override condition:** The configured attributes are reflected whenever the schedule time occurs or whenever the override attribute condition occurs, such as weekends and holidays.

### Updating a Daily Schedule

#### To update a daily schedule:

1. Double-click a daily schedule.

   The **Add Schedule Task** dialog box appears.
2. Update the information.
3. Click **Save**.

### Deleting a Daily Schedule

#### To delete a daily schedule:

- Right-click a daily schedule and then click **Delete**.

### Configuring a Weekly Schedule

You can configure a schedule to recur on the selected day(s) of the week, when the scheduled time occurs.

#### To configure a weekly schedule:

1. Select the **Scheduler** tab and then select the **Schedules** tab.
2. Right-click at any point on the grid and then click **Add**.

   The **Add Schedule Task** dialog box appears.
3. Enter the **Title**.
4. Select the **Zone** mode.
5. Select **Weekly**.
6. Select the **Schedule Time** from the drop-down menu.
7. Select **Fix Time**.
8. Select the recurrence days.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

9. Click the **+** icon to add attributes.
10. Enter the process system attributes information in the **Attributes Definition** grid.

    **Note**: You should enter the complete attribute name.
    Example: *Objectname.attributename* or *Hierarchyname.attributename*

11. Click **Save**.

    The weekly schedule is successfully configured.

### Overriding a Weekly Schedule

You can override the configured weekly schedule.

### To override a weekly schedule:

1. On the **Add Schedule Task** dialog box, select the **Override** check box.
2. Enter the **Attribute**.
3. Select the **Criteria** from the drop-down menu.
4. Enter the **Value**.
5. Click **Save**.

   The override condition is configured.

**Runtime**: Whenever the schedule time occurs and the configuration is reflected, you can view the schedule in the object viewer.

**Standard override condition:** The configured attributes are reflected whenever the schedule time occurs on a weekly basis or whenever the override attribute condition occurs.

### Updating a Weekly Schedule

### To update a weekly schedule:

1. Double-click a weekly schedule.

   The **Add Schedule Task** dialog box appears.
2. Update the information.
3. Click **Save**.

### Deleting a Weekly Schedule

### To delete a weekly schedule:

- Right-click a weekly schedule and then click **Delete**.

## Configuring a Holiday/Weekend Schedule

You can configure a schedule to execute when a scheduled holiday/weekend occurs.

### To configure a holiday/weekend schedule:

1. Select the **Scheduler** tab and then select the **Schedules** tab.
2. Right-click at any point on the grid and then click **Add**.

   The **Add Schedule Task** dialog box appears.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

3. Enter the **Title**.
4. Select the **Zone** mode.
5. Select **Holiday/Weekend**.
6. Select the **Schedule Time** from the drop-down menu.
7. Select **Fix Time**.
8. Select the **Zone**.
9. Select the configured **Holiday/Weekend**.
10. Click the **+** icon to add attributes.
11. Enter the process system attributes information in the **Attributes Definition** grid.

    **Note**: You should enter the complete attribute name.
    Example: *Objectname.attributename* or *Hierarchyname.attributename*

12. Click **Save**.

    The holiday/weekend schedule is successfully configured.

### Overriding a Holiday/Weekend Schedule

You can override the configured a holiday/weekend schedule.

### To override a holiday/weekend schedule:

1. On the **Add Schedule Task** dialog box, select the **Override** check box.
2. Enter the **Attribute**.
3. Select the **Criteria** from the drop-down menu.
4. Enter the **Value**.
5. Click **Save**.

   The override condition is configured.

**Runtime**: Whenever the schedule time occurs and the configuration is reflected, you can view the schedule in the object viewer.

**Standard override condition:** The configured attributes are reflected whenever the schedule time occurs on a holiday/weekend basis or whenever the override attribute condition occurs.

### Updating a Holiday/Weekend Schedule

### To update a holiday/weekend schedule:

1. Double-click a holiday/weekend schedule.

   The **Add Schedule Task** dialog box appears.

2. Update the information.
3. Click **Save**.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Deleting a Holiday/Weekend Schedule

### To delete a holiday/weekend schedule:

- Right-click a holiday/weekend schedule and then click **Delete**.

#### Configuring Zone-based Time Period Schedules

Zone-based fix time schedules are created for a particular zone for a specified time period. You can configure the zone-based time period schedules based on the following criteria:

- **One Time** - This schedule is executed only once, when the scheduled time occurs.
- **Daily** - This schedule is executed every day, when the scheduled time occurs.
- **Weekly** - This schedule is executed, recurring on the selected day(s) of the week, when the scheduled time occurs.
- **Holiday/Weekend** - This schedule is executed when the scheduled holiday/weekend occurs.

#### Configuring a One Time Schedule

You can configure a schedule to execute only once, when the scheduled time occurs.

### To configure a one-time schedule:

1. Select the **Scheduler** tab and then select the **Schedules** tab.
2. Right-click at any point on the grid and then click **Add**.

   The **Add Schedule Task** dialog box appears.
3. Enter the **Title**.
4. Select the **Zone** mode.
5. Select **One Time**.
6. Select the **Schedule Time** from the drop-down menu.
7. Select **Time Period**.
8. Click the **+** icon to add attributes.
9. Enter the process system attributes information in the **Attributes Definition** grid.

   **Note**: You should enter the complete attribute name.
   Example: *Objectname.attributename* or *Hierarchyname.attributename*
10. Click **Save**.

    The one time schedule is successfully configured.

### Overriding a One Time Schedule

You can override the configured one time schedule.

### To override a one time schedule:

1. On the **Add Schedule Task** dialog box, select the **Override** check box.
2. Enter the **Attribute**.
3. Select the **Criteria** from the drop-down menu.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

4. Enter the **Value**.
5. Click **Save**.

   The override condition is configured.

**Runtime**: Whenever the schedule time occurs and the configuration is reflected, you can view the schedule in the object viewer.

**Standard override condition:** The configured attributes are reflected whenever the schedule time occurs or whenever the override attribute condition occurs.

### Updating a One Time Schedule

### To update a one time schedule:

1. Double-click a one time schedule.

   The **Add Schedule Task** dialog box appears.
2. Update the information.
3. Click **Save**.

### Deleting a One Time Schedule

### To delete a one time schedule:

- Right-click a one time schedule and then click **Delete**.

## Configuring a Daily Schedule

You can configure a schedule to execute every day, when the scheduled time occurs.

### To configure a daily schedule:

1. Select the **Scheduler** tab and then select the **Schedules** tab.
2. Right-click at any point on the grid and then click **Add**.

   The **Add Schedule Task** dialog box appears.
3. Enter the **Title**.
4. Select the **Zone** mode.
5. Select **Daily**.
6. Select the **Schedule Time** from the drop-down menu.
7. Select **Time Period**.
8. Click the **+** icon to add attributes.
9. Enter the process system attributes information in the **Attributes Definition** grid.

   **Note**: You should enter the complete attribute name.
   Example: *Objectname.attributename* or *Hierarchyname.attributename*
10. Click **Save**.

    The daily schedule is successfully configured.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Overriding a Daily Schedule

You can override the configured daily schedule.

#### To override a daily schedule:

1. On the **Add Schedule Task** dialog box, select the **Override** check box.
2. Enter the **Attribute**.
3. Select the **Criteria** from the drop-down menu.
4. Enter the **Value**.
5. Click **Save**.

   The override condition is configured.

**Runtime**: Whenever the schedule time occurs and the configuration is reflected, you can view the schedule in the object viewer.

**Standard override condition:** The configured attributes are reflected whenever the schedule time occurs or whenever the override attribute condition occurs, such as weekends and holidays.

### Updating a Daily Schedule

#### To update a daily schedule:

1. Double-click a daily schedule.

   The **Add Schedule Task** dialog box appears.
2. Update the information.
3. Click **Save**.

### Deleting a Daily Schedule

#### To delete a daily schedule:

- Right-click a daily schedule and then click **Delete**.

### Configuring a Weekly Schedule

You can configure a schedule to recur on the selected day(s) of the week, when the scheduled time occurs.

#### To configure a weekly schedule:

1. Select the **Scheduler** tab and then select the **Schedules** tab.
2. Right-click at any point on the grid and then click **Add**.

   The **Add Schedule Task** dialog box appears.
3. Enter the **Title**.
4. Select the **Zone** mode.
5. Select **Weekly**.
6. Select the **Schedule Time** from the drop-down menu.
7. Select **Time Period**.
8. Select the recurrence days.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

9. Click the **+** icon to add attributes.
10. Enter the process system attributes information in the **Attributes Definition** grid.

    **Note**: You should enter the complete attribute name.
    Example: *Objectname.attributename* or *Hierarchyname.attributename*

11. Click **Save**.

    The weekly schedule is successfully configured.

### Overriding a Weekly Schedule

You can override the configured weekly schedule.

### To override a weekly schedule:

1. On the **Add Schedule Task** dialog box, select the **Override** check box.
2. Enter the **Attribute**.
3. Select the **Criteria** from the drop-down menu.
4. Enter the **Value**.
5. Click **Save**.

   The override condition is configured.

**Runtime**: Whenever the schedule time occurs and the configuration is reflected, you can view the schedule in the object viewer.

**Standard override condition:** The configured attributes are reflected whenever the schedule time occurs on a weekly basis or whenever the override attribute condition occurs.

### Updating a Weekly Schedule

### To update a weekly schedule:

1. Double-click a weekly schedule.

   The **Add Schedule Task** dialog box appears.
2. Update the information.
3. Click **Save**.

### Deleting a Weekly Schedule

### To delete a weekly schedule:

- Right-click a weekly schedule and then click **Delete**.

#### Configuring a Holiday/Weekend Schedule

You can configure a schedule to execute when a scheduled holiday/weekend occurs.

### To configure a holiday/weekend schedule:

1. Select the **Scheduler** tab and then select the **Schedules** tab.
2. Right-click at any point on the grid and then click **Add**.

   The **Add Schedule Task** dialog box appears.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

3. Enter the **Title**.
4. Select the **Zone** mode.
5. Select **Holiday/Weekend**.
6. Select the **Schedule Time** from the drop-down menu.
7. Select **Time Period**.
8. Select the **Zone**.
9. Select the configured **Holiday/Weekend**.
10. Click the **+** icon to add attributes.
11. Enter the process system attributes information in the **Attributes Definition** grid.

    **Note**: You should enter the complete attribute name.
    Example: *Objectname.attributename* or *Hierarchyname.attributename*

12. Click **Save**.

    The holiday/weekend schedule is successfully configured.

### Overriding a Holiday/Weekend Schedule

You can override the configured a holiday/weekend schedule.

### To override a holiday/weekend schedule:

1. On the **Add Schedule Task** dialog box, select the **Override** check box.
2. Enter the **Attribute**.
3. Select the **Criteria** from the drop-down menu.
4. Enter the **Value**.
5. Click **Save**.

   The override condition is configured.

**Runtime**: Whenever the schedule time occurs and the configuration is reflected, you can view the schedule in the object viewer.

**Standard override condition:** The configured attributes are reflected whenever the schedule time occurs on a holiday/weekend basis or whenever the override attribute condition occurs.

### Updating a Holiday/Weekend Schedule

### To update a holiday/weekend schedule:

1. Double-click a holiday/weekend schedule.

   The **Add Schedule Task** dialog box appears.
2. Update the information.
3. Click **Save**.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Deleting a Holiday/Weekend Schedule

**To delete a holiday/weekend schedule:**

- Right-click a holiday/weekend schedule and then click **Delete**.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# ScreenCaptureAndPrint App - Flex License Only

**Note:** The ScreenCaptureAndPrint requires an AVEVA Flex license. It is not included in the product installation. If you have a Flex license, you can follow the instructions in Installing the ScreenCaptureAndPrint app to download the application.

The ScreenCaptureAndPrint application is used for capturing and printing a single or multi-monitor screen. You can perform the following tasks using this application:

- Capture a screenshot from a single monitor and save it to a selected location on the drive.
- Capture a screenshot from one or all of the connected monitors and save it to a selected location on the drive.
- Capture a screenshot from a selected region on the connected monitor/monitors.
- Print the screen of a single monitor.
- Print the screens of one or all of the connected monitors.
- Print a selected region from the connected monitor/monitors.

## Prerequisites

You should install and configure the System Platform version 17.0.000 or higher.

For more information, refer to *System Platform Installation Guide*.

## Installing the ScreenCaptureAndPrint App

If you have an AVEVA Flex license, you can download the ScreenCaptureAndPrint app from the AVEVA Product Hub, then install it. Follow the procedures below.

**To download the ScreenCaptureAndPrint app**

1. Open the System Platform IDE.
2. From the **Home** ribbon, select **Galaxy**, then **Import**.
3. Select **Objects**,then **Explore product hub**.

   **Note:** You can also go directly to the Product Hub using this URL: https://softwaresupportsp.aveva.com/#/producthub
4. On the Product Hub, for **Product**, select **System Platform**.
5. For the **Download Type**, select **Add On**.
6. From the list, select the ScreenCaptureAndPrint app.

The app is downloaded as a .zip file which contains:

- a .**Digital Exchange** folder including a PKG file containing the app itself, a PDF User Guide for the app, and an HTML ReadMe file with additional information.
- a Print_App.zip folder containing a .aaPKG file with a sample application and supporting graphics files.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### To install the ScreenCaptureAndPrint app

1. Extract all files from the downloaded zip file. Select a destination folder that is accessible from the System Platform IDE.
2. In the System Platform IDE, from the **Home** ribbon, select **Galaxy**, then **Import**.
3. Select **Objects**, then **From package**.
4. Browse to the location of the .aaPKG file, select the file, and select **Open**.
5. On the **Import preferences** dialog box, leave the default selections and select **Import**.

This imports the application at the root level of the Visualization folder. You can drag it to any desired location in the folder, such as the **Default** > **Applications** folder.

### To install the sample print application

1. Extract all files from the downloaded **Print_App.zip** file. Select a destination folder that is accessible from the System Platform IDE.
2. In the System Platform IDE, from the **Home** ribbon, select **Galaxy**, then **Import**.
3. Select **Objects**, then **From package**.
4. Browse to the location of the .aaPKG file, select the file, and select **Open**.
5. On the **Import preferences** dialog box, leave the default selections and select **Import**.

This imports the sample application into a new PrintApp folder at the root level of the Visualization folder. You can drag it to any desired location in the Visualization folder.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Configuring the ScreenCaptureAndPrint Application

Perform the following steps to configure the application.

**To configure the application:**

1. Create a layout in a OMI ViewApp application.
2. Select the **ScreenCaptureAndPrint** app and drag it to the pane.
3. Click the **Properties** tab and then customize the properties.

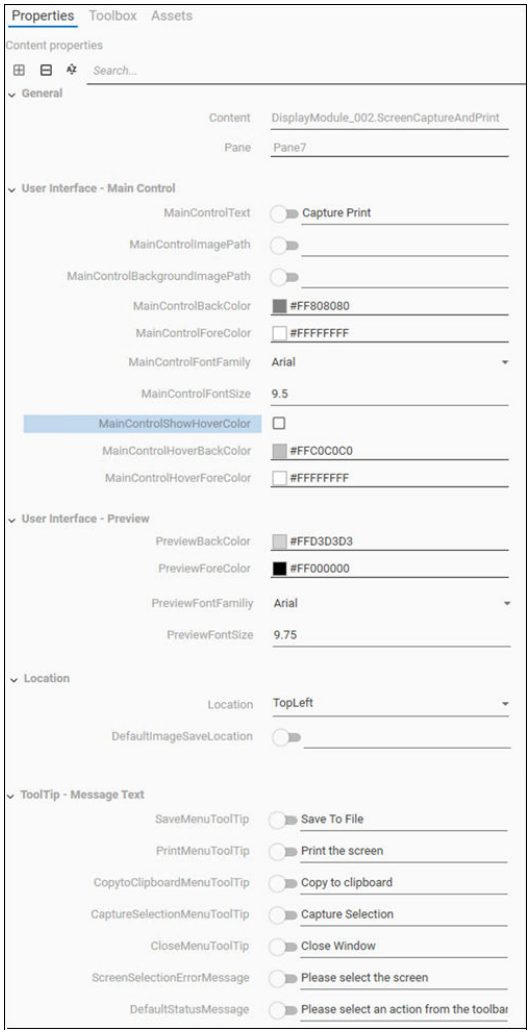
   For more information, refer to Customizing the Properties.

## Customizing the Properties

You should customize the following properties as required:

- General
- User Interface - Main Control
- User Interface - Preview
- Location
- ToolTip - Message Text
- Appearance
- Layout

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




## Customizing the General Properties

**To customize the general properties:**

- Select the pane from the **Pane** drop-down menu.

  The **Content** field is auto-generated. This content appears on the selected pane.

## Customizing the User Interface - Main Control

**To customize the User Interface - Main Control:**

- Customize the following properties:

| | |
|---|---|
| **MainControlText**<br>  | To customize the text on the *Main Control* (**Capture Print**) button.<br>You can customize the default text in the text box. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

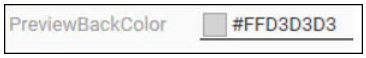
| | |
|---|---|
| **MainControlImagePath**<br>  | To set the path for the *Main Control* button image file.<br>You can enter the path in the text box. |
| **MainControlBackgroundImagePath**<br>  | To set the path for the *Main Control* button background image file.<br>You can enter the path in the text box. |
| **MainControlBackColor**<br>  | To customize the background color for the *Main Control* button.<br>You can select the color on the color picker from the drop-down menu. |
| **MainControlForeColor**<br>  | To customize the font color of the *Main Control* button.<br>You can select the color on the color picker from the drop-down menu. |
| **MainControlFontFamily**<br>  | To customize the font that appears on the *Main Control* button.<br>You can select the font from the drop-down list. |
| **MainControlFontSize**<br>  | To customize the size of the font that appears on the *Main Control* button.<br>You can click the text box to enter the font size. |
| **MainControlShowHoverColor**<br>  | To select the option to change the color of the *Main Control* button, on mouse hover.<br>If you select this check box, you should customize the **MainControlHoverBackColor** and **MainControlHoverForeColor** properties. |
| **MainControlHoverBackColor**<br>  | To customize the background color of the *Main Control* button, on mouse hover.<br>You can select the color on the color picker from the drop-down menu. |
| **MainControlHoverForeColor**<br>  | To customize the foreground color of the *Main Control* button, on mouse hover.<br>You can select the color on the color picker from the drop-down menu. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

## Customizing the User Interface - Preview

### To customize the User Interface - Preview:

- Customize the following properties:

| | |
|---|---|
| **PreviewBackColor**<br>  | To customize the background color of the preview screen.<br>You can select the color on the color picker from the drop-down menu. |
| **PreviewForeColor**<br>  | To customize the color of the font that appears on the preview screen.<br>You can select the color on the color picker from the drop-down menu. |
| **PreviewFontFamily**<br>  | To customize the font that appears on the preview screen.<br>You can select the font from the drop-down list. |
| **PreviewFontSize**<br>  | To customize the size of the font that appears on the preview screen.<br>You can click the text box to enter the font size. |

## Customizing the Location

### To customize the Location:

- Customize the following properties:

| | |
|---|---|
| **Location**<br>  | To customize the location on the screen where the preview appears.<br>You can select the location from the drop-down list. |
| **DefaultImageSaveLocation**<br>  | To set the location where the captured images are saved.<br>You can enter the path in the text box. |

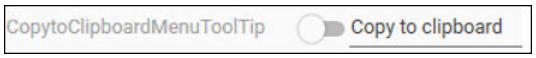
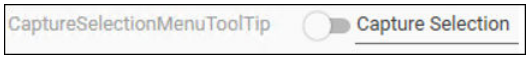
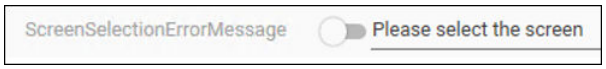
## Customizing the ToolTip - Message Text

### To customize the ToolTip - Message Text:

- Customize the following properties:

| | |
|---|---|
| **SaveMenuToolTip**<br>  | To customize the tooltip message that appears on the **Save** option.<br>You can customize the default text in the text box. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| **PrintMenuToolTip**<br>  | To customize the tooltip message that appears on the **Print** option.<br>You can customize the default text in the text box. |
| **CopytoClipboardMenuToolTip**<br>  | To customize the tooltip message that appears on the **Copy to Clipboard** option.<br>You can customize the default message in the text box. |
| **CaptureSelectionMenuToolTip**<br>  | To customize the tooltip message that appears on selecting a region to capture.<br>You can customize the default message in the text box. |
| **CloseMenuToolTip**<br>  | To customize the tooltip that appears on the **Close** option.<br>You can customize the default message in the text box. |
| **ScreenSelectionErrorMessage**<br>  | To customize the preview control error message that appears on the screen selection dialog box.<br>You can customize the default message in the text box. |
| **DefaultStatusMessage**<br>  | To customize the preview control default tooltip message at the bottom of the **Preview Control** window.<br>You can customize the default message in the text box. |

## Customizing the Appearance

You can customize the font, color and appearance of the user interface.

### To customize the appearance:

- Customize the following properties:

| | |
|---|---|
| **BorderBrush** | To customize the color of the Border of the Scheduler application.<br>You can select the color on the color picker from the drop-down menu. |
| **BorderThickness** | To customize the border thickness of the border.<br>You can click the text box to enter the value. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| **Background** | To customize the color of the background of all the tabs and their sub-controls, and dialog boxes of the *Scheduler* application.<br>You can select the color on the color picker from the drop-down menu. |
| **Foreground** | To customize the color of the font that appears on all the tabs and their sub-controls, and dialog boxes of the *Scheduler* application.<br>You can select the color on the color picker from the drop-down menu. |
| **FontFamily** | To customize the font that appears on all the tabs and their sub-controls, and dialog boxes of the *Scheduler* application.<br>You can select the font from the drop-down menu. |
| **FontSize** | To customize the size of the font that appears on all the tabs and their sub-controls, and dialog boxes of the Scheduler application.<br>You can click the text box to enter the font size. |
| **FontStretch** | To customize the font that appears on all the tabs and their sub-controls, and dialog boxes of the *Scheduler* application.<br>You can select the font from the drop-down menu. |
| **FontStyle** | To customize the font stylr that appears on all the tabs and their sub-controls, and dialog boxes of the *Scheduler* application.<br>You can click the text box and enter of the following values: Normal, Italic and Oblique. |
| **FontWeight** | To customize the font stylr that appears on all the tabs and their sub-controls, and dialog boxes of the *Scheduler* application.<br>You can click the text box and enter a value from 100 to 900. |

### Customizing the Layout

You can customize the alignment and padding of the user interface.

#### To customize the layout:

- Customize the following properties:

| | |
|---|---|
| **HorizontalContentAlignment** | To customize the horizontal alignment of the content of the Scheduler application.<br>You can select an option from the drop-down menu. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| **VerticalContentAlignment** | To customize the vertical alignment of the content of the Scheduler application.<br>You can select an option from the drop-down menu. |
| **Padding** | To customize the padding for the content of the *Scheduler* application.<br>You can click the text box and enter the value. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Using the Application

You can use the application to perform the following tasks:

- Capturing the selected screen/ multiple screens.
- Saving the captured screenshot
- Copying to clipboard
- Printing the screen/ multiple screens

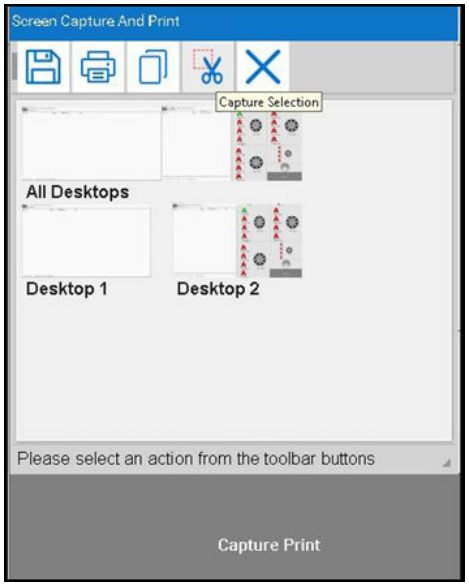
## Capturing the Screen

**To capture a selected screen:**

1. Open the *ScreenCaptureAndPrint* application in the required layout.
2. Click **Capture Print**.

   **Note**: The name of the *Main Control* button is set to **Capture Print** by default.

   The **Preview Control** window appears.
3. Click the **Capture Selection** icon.
4. Select the screen that you want to capture.

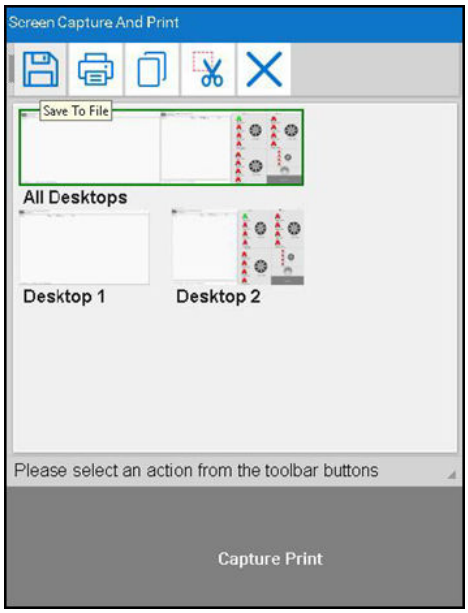



## Saving the Captured Screenshot

**To save the captured screenshot:**

- Select the **Save** icon**.**

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

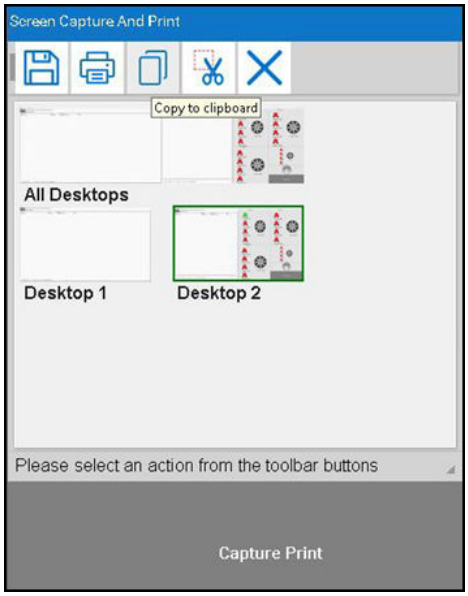



The captured screenshot is saved to the specified location.

## Copying to Clipboard

**To copy the selected screen to clipboard:**

- Select the **Clipboard** icon.



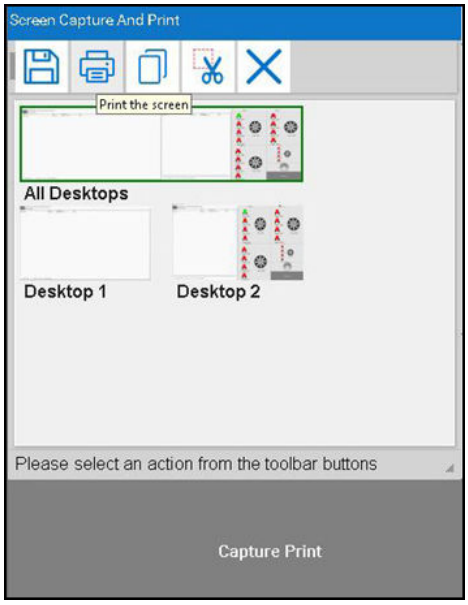

The selected screen is copied to the clipboard. Later, you can save the screenshot to the specified default path by clicking the **Save** icon.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

## Printing the Screen

**To print the screen:**

- Select the **Print** icon.

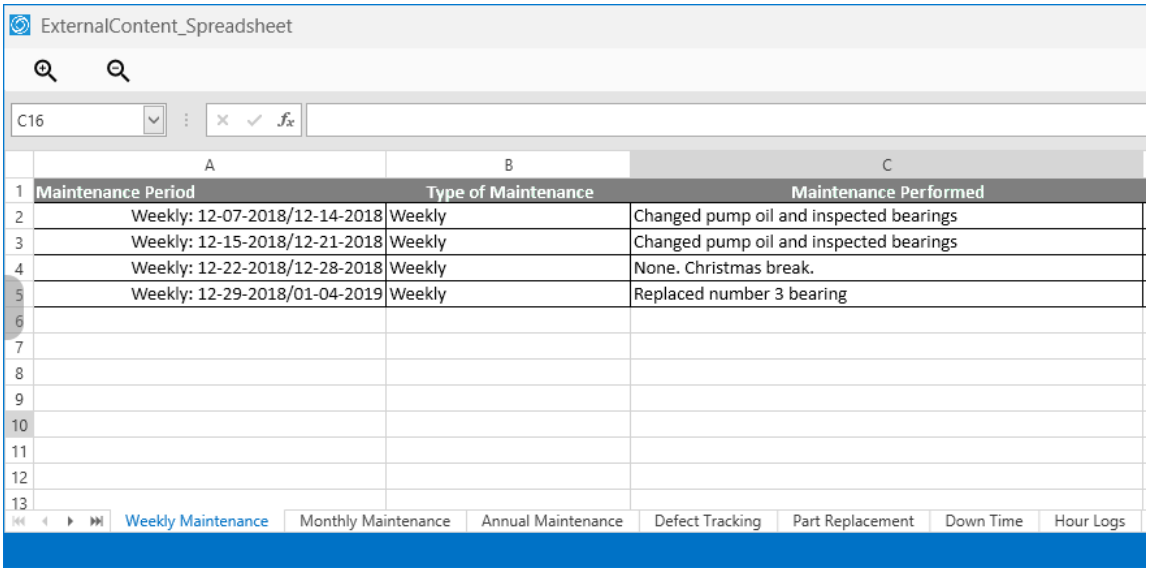



The selected screen is printed.

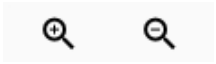
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Chapter 13 SpreadsheetViewerApp

The SpreadsheetViewerApp shows an Excel spreadsheet within a pane of a ViewApp while the ViewApp is running or is in preview mode. The SpreadsheetViewerApp initially shows the first worksheet of the spreadsheet at 100 percent zoom scale. No permanent editing changes can be made to a spreadsheet while it is displayed in the SpreadsheetViewApp.




The SpreadsheetViewerApp includes a set of visual controls that appear above the displayed spreadsheet. These controls can be used to change the zoom level of a spreadsheet.



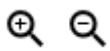
The SpreadsheetViewerApp also includes a slider zoom control in the status bar beneath the displayed document. Moving the slider left or right zooms the spreadsheet view in or out.




## Change the Zoom Level of a Spreadsheet

The SpreadsheetViewerApp provides several methods to set the zoom level of the worksheet shown in preview mode or a running ViewApp. A worksheet can be zoomed out to a minimum of ten percent of its original size or zoomed in to a maximum of 400% using the slider magnification tool, or to an infinite percentage using the zoom control magnifier icon.

- Zoom in and zoom out controls

  These controls appear above the displayed document on the menu bar. Each time the user selects a zoom in or zoom out control, the view magnification increases or decreases by 15 percent.

- Zoom slider control

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




The slider control appears beneath the displayed document on the status bar. Moving the slider right or left increases or decreases the magnification of the document view.

Users can also select the **+** or **-** controls at the ends of the slider. Each press of the **+** or **-** control increases or decreases magnification in increments of 10 percent.

# Touch Support

The SpreadsheetViewerApp supports single finger gestures on touch screens or portable devices.

- A spreadsheet can be flicked vertically or horizontally to move to different areas of the spreadsheet.
- A single finger tap can be used to select the visual icons shown within the viewer window of the SpreadsheetViewerApp.

See Optimize the SpreadsheetViewerApp for a Touch Device for instructions to enlarge the size of the visual icons to make it easier to select them while using touch gestures.

## Optimize the SpreadsheetViewerApp for a Touch Device

The visual icons shown within the viewer window of the SpreadsheetViewerApp can be enlarged to make them easier to select on touch screens or portable devices.

The following screen captures show the default size of the SpreadsheetViewerApp's visual icons and their size after they have been enlarged for touch. AVEVA OMI includes the OptimizeForTouch Boolean attribute that belongs to the MyViewApp.Settings namespace. The default value of OptimizeForTouch is false. When OptimizeForTouch is set to true, the size of the visual icons is enlarged.

| **OptimizeForTouch Attribute Value** | **Icon Size** | **Example Icons** |
|---|---|---|
| MyViewApp.Settings.OptimizeForTouch= False | Regular Size (Non-Touch) |  |
| MyViewApp.Settings.OptimizeForTouch= True | Optimized for Touch |  |

A common way to dynamically adjust the size of the visual icons in a running ViewApp is to place a graphic element like a button on a pane and then associate user input animation to toggle the state of the OptimizeForTouch attribute.

# Compatibility of the SpreadsheetViewerApp

The SpreadsheetViewerApp includes compatibility with current and future versions of System Platform.

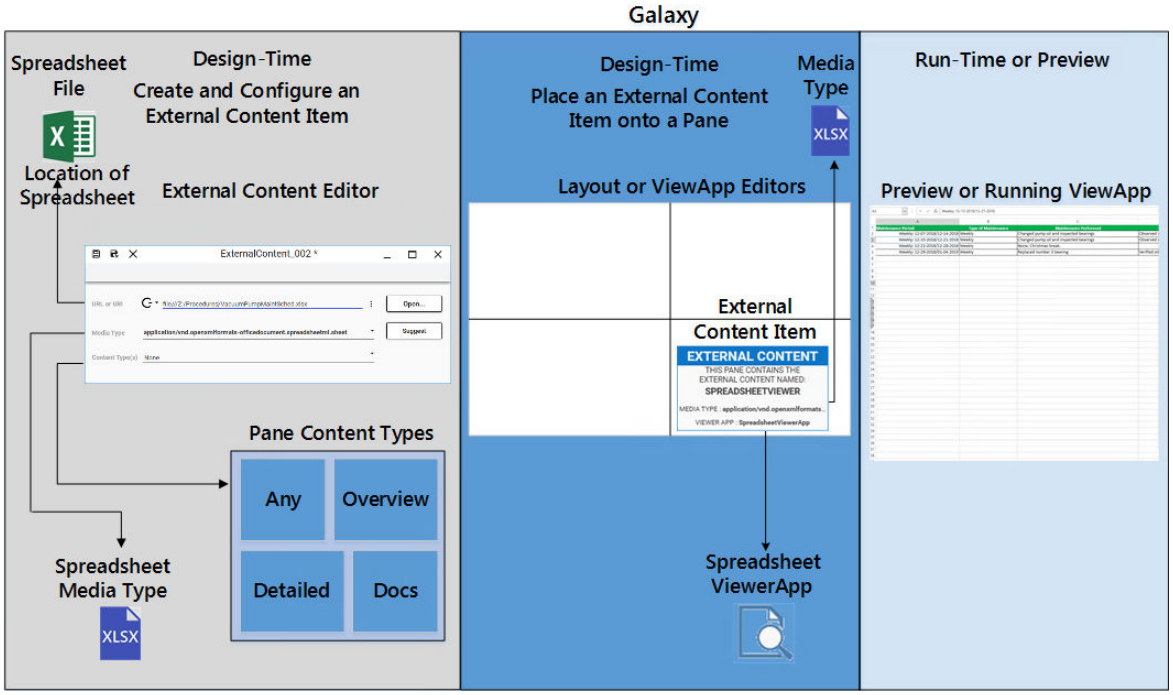
- The SpreadsheetViewerApp package must be installed on a computer running System Platform 2017 Update 3. The SpreadsheetViewerApp cannot be installed on any other version of System Platform except Update 3.
- After the SpreadsheetViewerApp is installed on a System Platform 2017 Update 3 system, the SpreadsheetViewerApp will be able to migrate to future versions of System Platform InTouch OMI when they become available.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Configure the SpreadsheetViewerApp

The following figure summarizes using an External Content item to point to a remote computer containing a spreadsheet file. An External Content item is configured during design time to identify the location of the spreadsheet and its media type.

The External Content item is associated with an asset or a user defined object. The asset or object is selected from the **Toolbox** tab and placed onto a layout pane. During runtime, the user selects an asset associated with a navigation item to view the documentation included in the spreadsheet.




The major steps to implement the SpreadsheetViewerApp to show spreadsheets in a ViewApp are summarized in the following list:

1. Place a spreadsheet on a computer accessible from your Galaxy.
2. Create an External Content item.
3. Configure the External Content item that identifies the location and media type of the spreadsheet.
4. Associate an External Content item to a graphic or object.
5. Place an asset or graphic on a ViewApp pane associated with the External Content item.

## Before You Begin

Before starting the steps to configure an External Content item, ensure the following prerequisites have been met:

- If you are placing the spreadsheet on a remote computer in your network, ensure connectivity between the computer where the ViewApp will run and the computer where the remote spreadsheet has been saved.

  Mapping a network drive is a typical way to connect to a remote computer hosting documents that you want show in a running ViewApp. For this configuration to work successfully, it is important that the computer to

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

which the ViewApp is launched from has the same drive letter mapped to a location having the referenced document.

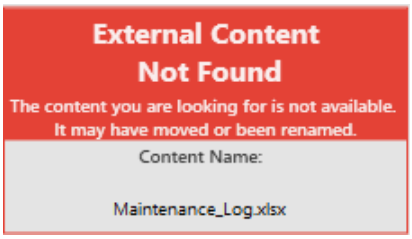
The SpreadsheetViewerApp shows an error message to the user if the specified URI connection to the Excel spreadsheet file is bad. For more information about the error message, see SpreadsheetViewerApp Error Message.

- Save the spreadsheet in the presentation format that you want to display in the SpreadsheetViewerApp.

**Important**: The SpreadsheetViewerApp only supports the xlsx Excel file type. The earlier xls Excel file type is not supported.

### SpreadsheetViewerApp Error Message

An External Content item includes an **URL or URI** option to specify the location of the Excel file to be shown by the SpreadsheetViewerApp during runtime or in preview mode. The specified location of the file must be complete and accurate. If the file is moved, deleted, or renamed, the SpreadsheetViewerApp shows an error message to the user during runtime, but the ViewApp continues to run.




## Create an External Content Item

You create an External Content item from the Visualization folder of the System Platform IDE. Initially, the External Content item defaults to a set of values that can be changed using the External Content editor.

### To create an External Content item

1. Open the IDE and select the **Visualization** tab.
2. Select a folder within the **Visualization** folder if you want to create a new External Content item at a specific location.
3. On the **Home** ribbon, in the **Create** area, select **External content**.

   You can also create an External Content item by other methods:

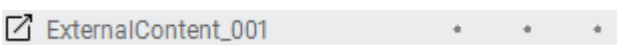
   - **Keyboard Shortcut**

     Press Ctrl + Shift + C

   - **Shortcut Menu**

     Right-click a folder of the **Visualization** folder to show a shortcut menu. Select the **New** option, and then select **External Content**.

   A new **External Content** item is created in the **Visualization** folder**.**

   The name of the new item follows a default naming convention of appending a three-digit number to the word ExternalContent.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

4. Rename the External Content item.

After you create an External Content item, it must be configured to specify the remote location of the content and its media type.

## Configure an External Content Item for the SpreadsheetViewerApp

Each External Content item has three properties that must be assigned values:

- **URL or URI**
- **Media Type**
- **Content Type(s)**

An External Content item is modified from the External Content editor. The editor can be opened by double-clicking on an item from the Visualization folder. Also, an External Content item that has been placed onto a layout pane can be edited from the Layout and ViewApp editors by the selecting the item from the Actions list.

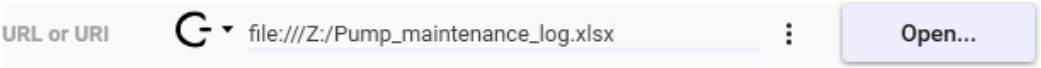
### To configure an External Content Item

1. Open the IDE and select the **Visualization** tab to show the External Content items available in the Galaxy.
2. Double click an External Content item to open it in the External Content editor.

   For more information about each field in an External Content item, see Details of the External Content Editor.
3. Enter a URI string or web site URL in the **URL or URI** field where the spreadsheet is saved.

   The value you enter is the location of the external content specified by a URI-formatted string. A media location must be specified.

   You can browse for the spreadsheet file by selecting the vertical dots icon to the right of the data entry field. A drop-down list includes a **Browse for file** option that enables you to browse your network and select a media file. The **URL or URI** field updates and shows a formatted URI path to the file.

   You can also enter a URL to a web site by selecting the **http://** or **https://** options from the drop-down list. The **http://** and **https://** options assist the user when entering URLs by prefixing the URLs with the selection.

   See More Information About Specifying a URI, More Information About Specifying a URI, More Information About Specifying a URI, More Information About Specifying a URI for information about the format of a URI string.
4. Select the **Open** button to validate the URI or URL you entered.

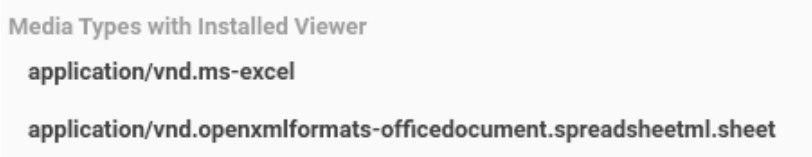
   The **Open** button launches the appropriate application associated with a xlsx file type, which is usually Excel to display the document specified in the **URL or URI** field.
5. Select the type of media associated with spreadsheets from the drop-down list of the **Media Type** field.

   The value you enter is the MIME type of a spreadsheet. The SpreadsheetViewApp provides two Excel spreadsheet MIME types, as shown in the following screen capture.

   - The application/vnd.ms-excel Media Type is for legacy .xls Excel files.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- The application/vnd.openxmlformats-officedocument.spreadsheetml.sheet Media Type is for .xlsx Excel files.

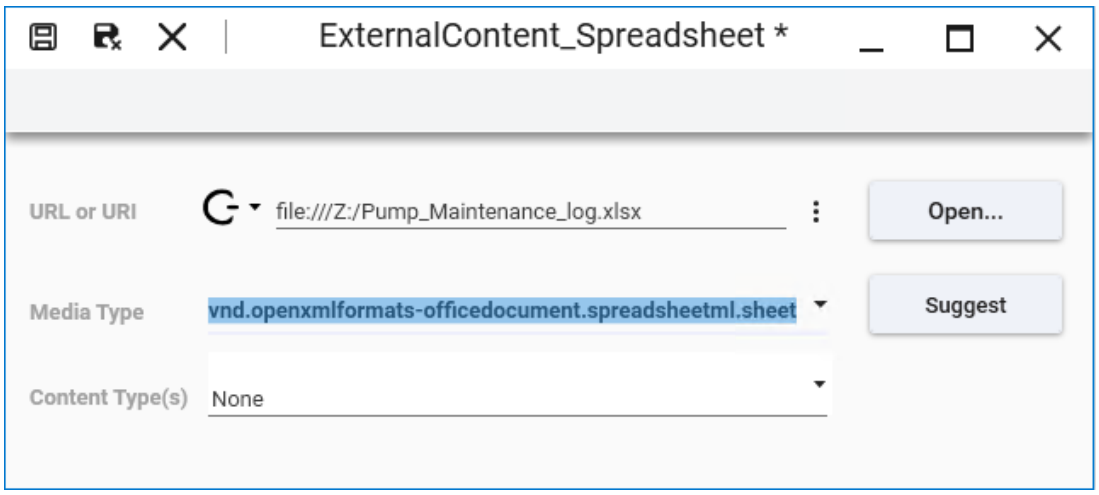



See More Information About Media Types, More Information About Media Types, More Information About Media Types, More Information About Media Types for information about supported media types.

6. Select the type of content from the drop-down list of the **Content Type(s)** field.

   The value you enter is used by content-placement algorithms within AVEVA OMI during run time to determine the placement of content when AutoFill or ShowContent calls are invoked.

   The following screen capture shown an External Content item configured for a spreadsheet.




7. Save your changes and exit from the External Content item.

## Link an External Content Item to an Object or Template

There are three ways to integrate an External Content in a ViewApp.

- Associate an External Content item to an object template, which is described in the following procedure
- Associate an External Content item to a custom navigation item that appears in the navigation model of the ViewApp.
- Place the External Content item on a layout pane, which is the simplest way and is described in Associate an External Content Item to a ViewApp.

### To link an External Content item to an object template

After you have created and configured an External Content item, you can link it to an object template. External Content items can be linked only to objects as opposed to graphics, which can be linked to or owned by an object. All External Content items reside in the Visualization folder. A single External Content item can be linked to multiple objects.

1. Open an object template in the **Object Editor**.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

2. Select the **Attributes** tab.
3. In the **Content** pane, select the **Link Content** button.

   The Galaxy Browser opens.
4. Navigate to the folder that contains the **External Content** item to be linked.
5. Select the item, then click **OK**.

   The item is added to the object and appears in the **Content** tab.

   **Note:** After linking an External Content item, you can modify it by selecting it and then pressing the **Edit** button. However, any changes you make will apply to all objects that link to the item.
6. Save your editing changes to the object template and exit from the Object Editor.
7. Create an instance of the of the linked object template.
8. Create a layout which contains pane with a Content Type that matches the content type of the External Content item.
9. Add a navigation tree to the layout
10. Create a ViewApp that incorporates the layout.
11. Deploy the ViewApp.

    In runtime, navigate to the object or any instance created from the template. External Content item will auto-fill the matching pane to show the external content.

## Associate an External Content Item to a ViewApp

You can place an External Content item directly onto a pane from either the Layout or ViewApp editors . External Content items are listed in the **Toolbox** or **Assets** tabs of either editor.

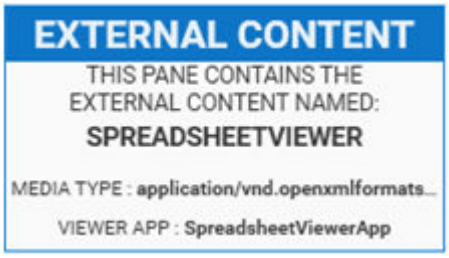
### To associate external content to a ViewApp

1. Open the System Platform IDE and select the **Visualization** tab to see the list of layouts.
2. Double-click the layout that you want to add external content to. It opens in the Layout editor.
3. Select the **Toolbox** tab of the Layout editor to show the content accessible from the Galaxy.
4. Locate the External Content item you want to place in the layout you selected.

   External Content thumbnails appear beneath of the list of content shown in the **Toolbox** list.
5. Drag and drop an External Content thumbnail from the **Toolbox** area onto a pane of the layout.

   The External Content thumbnail appears in the pane containing the name of the External Content item, the media type of the external content, and the viewer app that will display the media during runtime. Also, the layout **Actions** area shows the name of the External Content item and the pane that it was placed in.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.



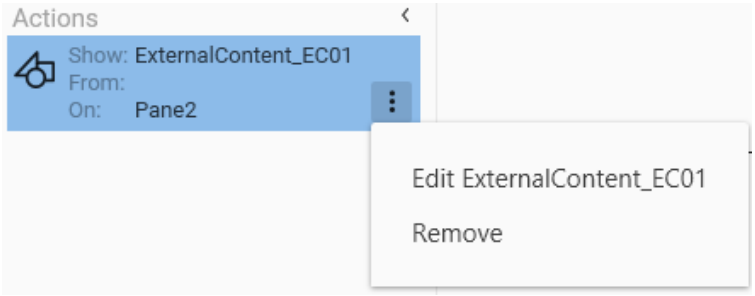

## Editing an External Content Item After Being Placed onto a Pane

An External Content item can be modified after being placed in a layout or a ViewApp, which automatically propagates the changes

### To edit an External Content item in a layout

1. If necessary, open the layout containing an External Content item.
2. Locate the item in the layout **Actions** list.
3. Select the **Options** icon shown at the right of the item in the **Actions** list.

   A drop-down list shows an Edit External Content command.




4. Select the **Edit** command.

   The External Content editor opens the item for editing.
5. Update the values assigned to the item and save your changes.

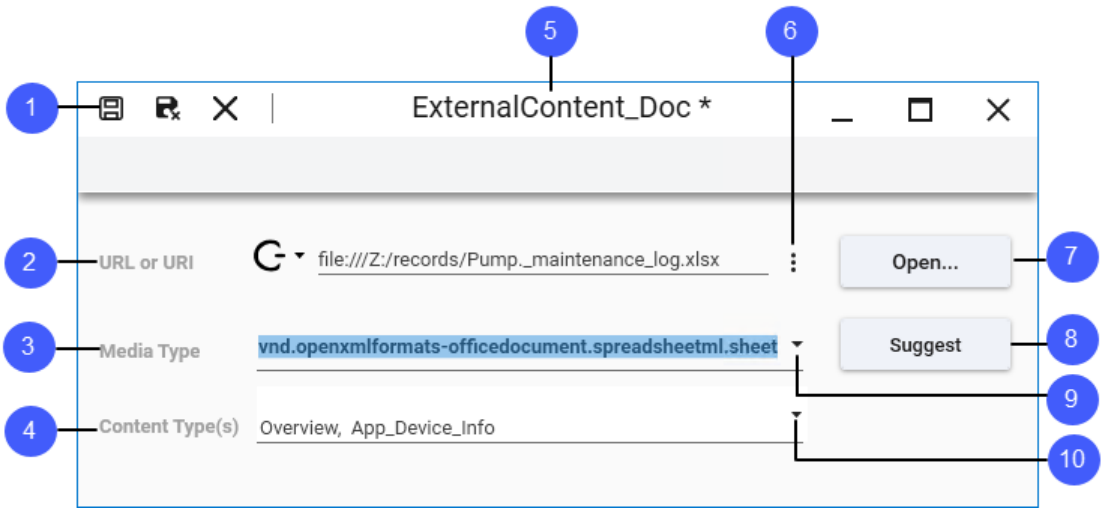
   The External Content thumbnail placed in a pane updates to reflect the changes made to the item.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Details of the External Content Editor

You use the External Content editor to configure an External Content item for a document. Before you configure an External Content item, you must know:

- Network location of a document
- Media type of the document
- Content type(s) of the layout pane that will host the External Content item




| | |
|---|---|
| 1 | Commands to save, save and close, and close the External Content editor. |
| 2 | URL or URI that specifies the location of external media using a standard format. See More Information About Specifying a URL or URI for the format of a URI or URL<br>A warning message appears if the document cannot be located during runtime. |
| 3 | A media type is a two-part identifier that specifies the type of application required to process or view remote content. A media type can be entered in the field or selected from a drop-down list. See More Information About Specifying a MediaType for the format of a Media type value.<br>A warning message appears if a media type is specified that does not have an associated viewer application. |
| 4 | Content type assigned to the external media that enables ViewApp algorithms to place content in specific panes during runtime. |
| 5 | Name of the External Content item. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| 6 | Drop-down list with options to browse for an external content file or specify a URL using HTTP or HTTPs. |
| 7 | Validates the location of external media specified in the **URL or URI** field. An attempt is made to display the external media in an application assigned as the default by the operating system, not the app specified for the external content media type.<br>A warning message appears if the content cannot be found at the location specified in the **URL or URI** field. |
| 8 | **Suggest** is optional. When selected, it automatically selects a media type based on the entry in the **URL or URI** field. The entered value can be changed if the suggestion does not match the expected media type.<br>**Note**: Ensure the suggested media type is correct. The external media does not appear if the media type is incorrect. |
| 9 | Drop-down list of commonly used media types. Media types that have apps in the Galaxy capable of servicing them are shown in bold text. |
| 10 | Drop-down list of content types that can be used at preview\runtime to assign the external content to panes of a matching content type.<br>**Note**: None is not a content type. Instead, it simply means a content type has not been assigned to the pane. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

## More Information About Media Types

A media type is a standard two-part string analogous to a MIME type that identifies external content file types and their format. System Platform uses a media type to identify external content and the type of app required to display media during runtime.

A media type consists of a type and a subtype, which is further structured into a tree.

type "/" [tree "."] subtype ["+" suffix] *[";" parameter]

For more information about the format of media types, see https://www.iana.org/assignments/media-types/media-types.xhtml

System Platform provides several default media types that include associated apps to display media. The drop-down list of the **Media Type** field shows the default media types in bold text to indicate a viewer app is available in the Galaxy that can service external content with these media types. Other listed media types that appear in plain text require an app to be created and imported into a Galaxy to play the specified media.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

## More Information About Specifying a URI

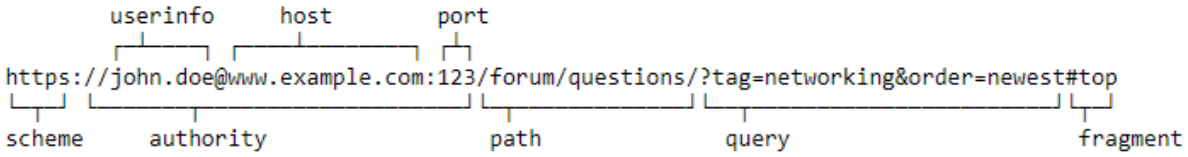
In the context of External Content, a Uniform Resource Identifier (URI) is a string that identifies the pathway to specific content that can appear in a running ViewApp.

All URIs adhere to predefined syntax rules.

- Generic URI syntax consists of a hierarchical sequence of components

  ```
  URI = scheme:[//authority]path[?query][#fragment]
  ```

  **Example**

- Each URI begins with a scheme name followed by a colon

  Examples of common scheme names include http:, https:, and file:

- An optional authority component preceded by two slashes (//)
  - Use information component consisting of a user name and optional password preceded by a colon followed by an at symbol (@)

    //username:password@

  - Host subcomponent consisting of a registered hostname or IP address
- A path component consisting of a sequence of path segments separated by a slash (/). A path is always defined for a URI, though the defined path may be empty
- An optional query component preceded by a question mark (?), containing a query string of non-hierarchical data.

For more information about the format of a URI, see https://tools.ietf.org/html/rfc3986

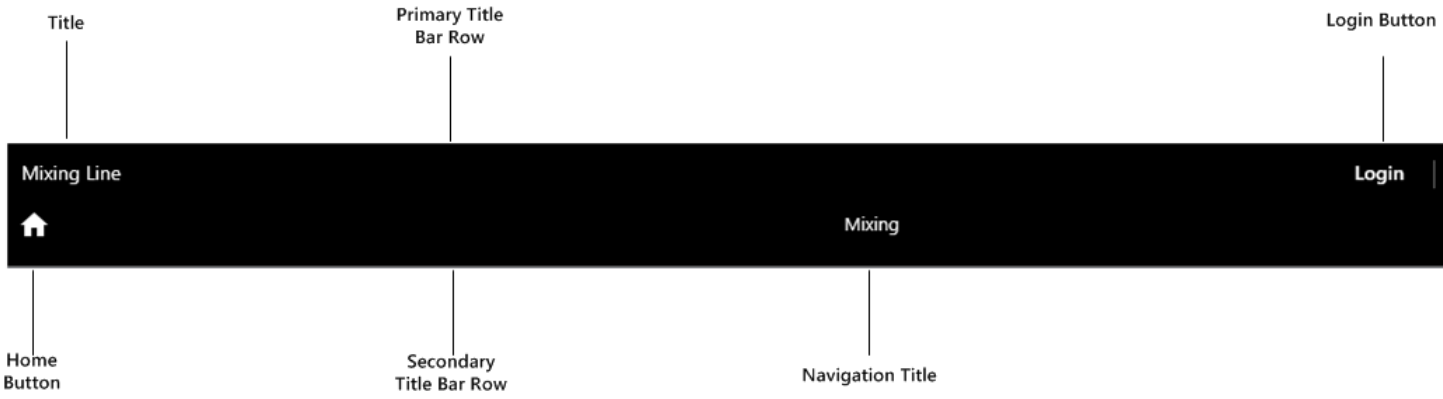
The following examples show common URIs that identify External Content within a Galaxy

- ftp://ftp.is.co.za/rfc/rfc1808.txt -- ftp scheme for File Transfer Protocol services
- file:///Z:/Media/Runtime%20Language%20Switching.mp4
- http://www.exampleserver.com/documents/index.html

# TitleBarApp

The TitleBarApp appears in a pane typically placed at the top of a ViewApp window. The app includes a set of properties to add functional components to the title bar. Many of the properties include positional options to place these components at specific locations on the title bar.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




# Configure a Title Bar

The TitleBarApp includes several sets of properties whose values determine the components that appear on a title bar, the component functionality, and how these components are positioned on a title bar.

**To configure the TitleBarControl**

1. Open the Layout Editor and create a pane at the top of the intended ViewApp window.

   The pane width can extend to the full width or only partial width of the window.
2. Adjust the height of the pane.
3. Show the items listed in the **Toolbox** tab.
4. Open the **AVEVA OMI Apps** folder to show the list of default apps.
5. Select **TitleBarApp** from the **Toolbox** list.

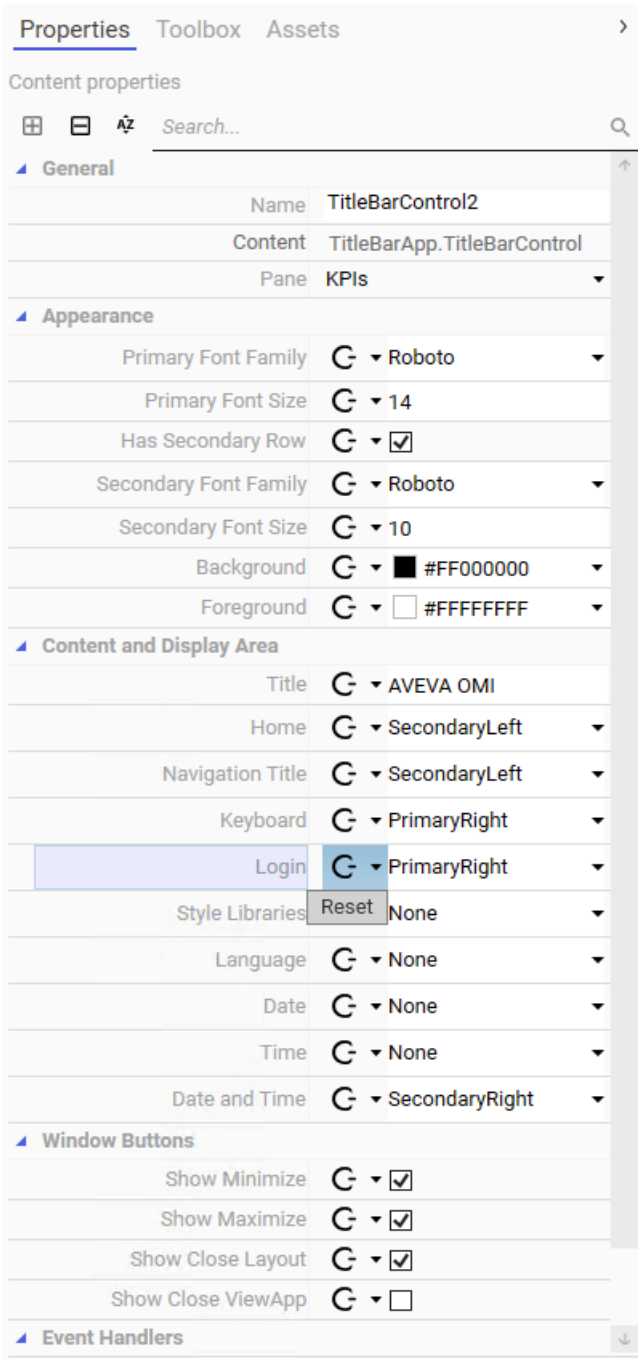
   A TitleBarApp thumbnail graphic appears at the bottom of the **Properties** grid area.
6. Drag and drop the TitleBarApp thumbnail to the layout pane you created.
7. Select the thumbnail within the pane and select the **Properties** grid.

   The **Properties** grid shows the properties of the TitleBarApp. See More Information About TitleBarApp Properties for the details of each property.
8. Assign values to the properties.
9. Save your changes.

# More Information About TitleBarApp Properties

TitleBarApp properties appear on the **Properties** page by the following functional groups. Many of the properties include fields containing options to position functional components at a specific location on the title bar. You can reset any property by selecting the arrow before the text entry field and selecting **Reset**.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




## Appearance Properties

| | |
|---|---|
| **Primary Font Family** | Option to specify the font family for text shown on the primary row of a title bar. Robot default font. |
| **Primary Font Size** | Point size of text shown on the first row of a title bar. 14 points is the default font size. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| **Has Secondary Row** | Option to include or exclude a secondary title bar row immediately beneath the primar<br>default is to include a secondary title bar row.<br>**Note**:<br>**Has Secondary Row** must be selected to show the two **Secondary Font** properties liste |
| **Secondary Font Family** | Option to specify the font family for text shown on the secondary row of a title bar. Rob<br>default font. |
| **Secondary Font Size** | Point size of text shown on the secondary row of a title bar. 10 points is the default fon |
| **Background** | Color of the TitleBarApp background shown in the pane of a running ViewApp. Select t<br>**Background** field to show a small triangle at the right. Select the triangle to show a colo<br>set the background color. Black or #FF000000 is default background color. |
| **Foreground** | Color of the TitleBarApp foreground shown in the pane of a running ViewApp. Select th<br>**Foreground** field to show a small triangle at the right. Select the triangle to show a colo<br>set the foreground color. White or #FFFFFFFF is the default foreground color. |

### Content and Display Area Properties

| | |
|---|---|
| **Title** | Static text string to include on a title bar. AVEVA OMI is the default title. |
| **Home** | Shows a **Home** button, which the user selects to set the focus of the ViewApp to the ro<br>ViewApp navigation model. The default is to show the **Home** icon.<br>The property includes a drop-down list to select the location within a title bar to place t<br>button. **SecondaryLeft** is the default location of the Home icon. |
| **Navigation Title** | Shows the title of the current selected navigation item. The default is to show the **Navig**<br>The property includes a drop-down list to select the location within a title bar to place t<br>**Title**. **SecondaryLeft** is the default location. |
| **Keyboard** | Shows a keyboard button, which the user selects to show an on-screen keyboard within<br>window. The default is to show the **Keyboard** icon.<br>The property includes a drop-down list to select the location within a title bar to place t<br>button. **PrimaryRight** is the default location.<br>Based on a retentive attribute setting in the MyViewApp.ViewApp namespace, you can<br>standard Windows keyboard (default) or the built-in AVEVA OMI keyboard. See in the A<br>SDK Help for more information. |
| **Login** | Shows an optional **Login** button, which the user selects to show a log in dialog box to er<br>username and password. The default is to show the **Login** button.<br>When a user logs in to a ViewApp, the **Login** button and drop arrow are shown. Pressing<br>automatically logs out the current user from the ViewApp. Pressing the drop arrow sho<br>“Login” and “Logout”. The “Login” option enables a different user to log in to the ViewA<br>The default position of the Login button on a title bar is **PrimaryRight**. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| **Language** | Shows an optional **Language** button, which the user can select to show a list of languag for the ViewApp. The current language is the caption of the **Language** button. Selecting language from the list changes the language used by the running ViewApp. The default hide the Language button.<br>The property includes a drop-down list to select the location within a title bar to place t button. |
| **Date** | Shows the current date formatted as MM/DD/YYYY. The default is **None** to hide the **Dat** |
| **Time** | Shows the current time formatted as HH:MM AM/PM. The default is **None** to hide the T |
| **Date and Time** | Shows the current date and time formatted as MM/DD/YYYY HH:MM AM/PM.<br>The property includes a drop-down list to select the location within a title bar to place t time. **SecondaryRight** is the default location. |

### Window Buttons Properties

| | |
|---|---|
| **Show Minimize** | Inserts a Minimize icon on the title bar that minimizes a running ViewApp window to the window's task bar when selected. The default is to show the **Minimize** icon. |
| **Show Maximize** | Inserts a Maximize icon on the title bar that maximizes a running ViewApp window t size when selected. The default is to show a **Maximize** icon.<br>The **Maximize** icon changes to a Restore Down icon on the title bar after the ViewAp been maximized. Selecting the Restore Down icon restores the ViewApp window to its before it was maximized. |
| **Show Close Layout** | Inserts a Close Layout icon on the title bar, which closes the current layout running i window when selected. The default is to show the **Close Layout** icon. |
| **Show Close ViewApp** | Inserts a Close ViewApp icon on the title bar that closes an entire running ViewApp selected. The default is to hide the **Show Close ViewApp** icon. |

### Event Handlers

| | |
|---|---|
| **Available Events** | Lists all available events of the TitleBarControl from a list that appears by double-clickin entry field. Select one or more events from the list to create event handlers that can be scripting.For more information about event handler scripts, see Write an Event Handler |

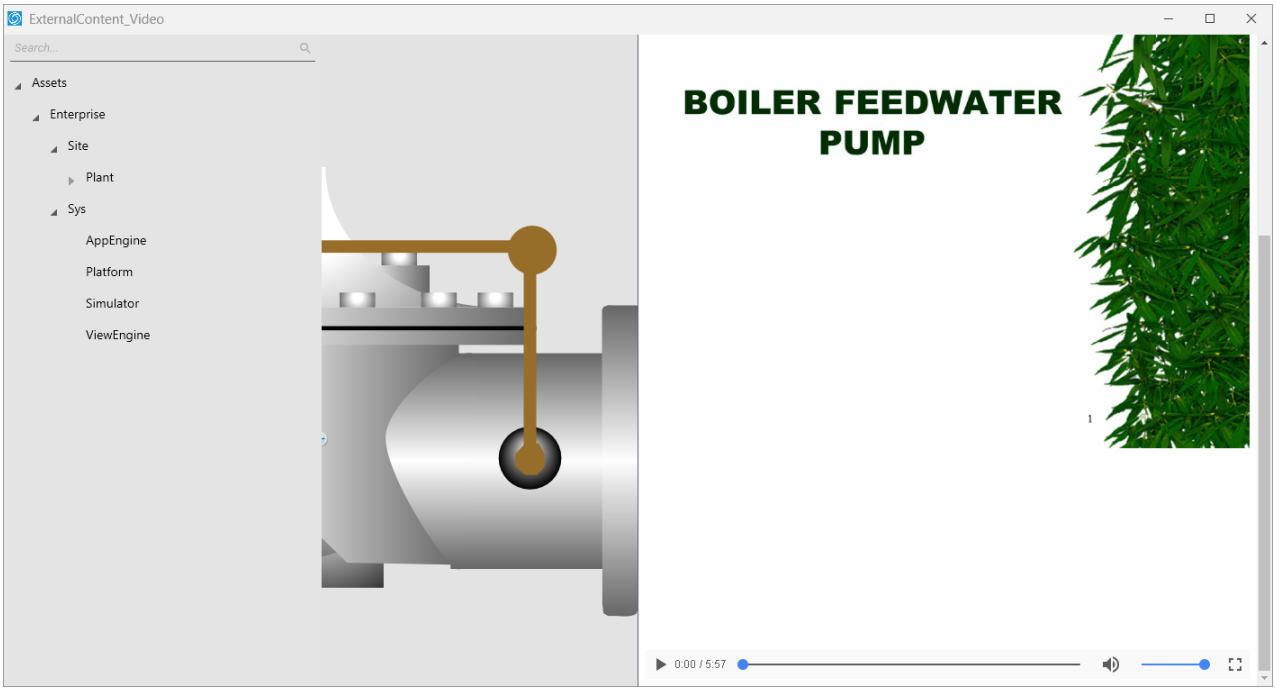
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Chapter 14 VideoViewerApp

The VideoViewerApp shows a pre-recorded video within a pane of a running ViewApp or while displayed in preview mode.

The VideoViewerApp initially shows the video paused at 0:00 seconds. Users must select the play button to start the video. The video plays in loop mode in which it will automatically repeat after reaching the end. Also, the audio is muted. Users must select the sound icon to enable video audio.

The VideoViewerApp provides functionality similar to viewing a video on a web page. Some video properties can be changed while a video is running like sound volume. But, no permanent editing changes can be made to a video while displayed by the VideoViewerApp.




## Supported Video Formats

The VideoViewerApp supports the video formats shown in the following table. The VideoViewerApp includes a separate MIME type for each supported video format that is specified as a value of the External Content Item **Media Type** property.

| Video Format | Video File Extension | Supported MIME Type |
|---|---|---|
| MPEG-4 | .mp4 | video/mp4 |
| OGG | .ogg | video/ogg |
| WebM | .webm | video/webm |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Playback Controls of the VideoViewerApp

Videos appear within a frame that contains player controls at the bottom of the frame. Users can change some aspect of video playback by changing a control setting while the video is playing.




During runtime or in preview mode, the cursor must be placed in the pane containing the video to show the playback controls.

## Pause and Play Control

The pause and play control toggles between two states to start or pause the playback of a video. When a ViewApp starts running, the video is paused. The user must select the control to start the video.



Users can pause the playback of a video while a ViewApp is running by selecting the pause control.



Selecting the play and pause control again starts the video at the time where it was paused.

## Playback Slider Control

Users can move a playback slider left or right to show the content of a video at a selected time within its entire length. The following example shows the playback slider has been positioned to one minute 12 seconds of a video that is five minutes and 57 seconds long.




Using a press and hold gesture with a mouse or by touch, the slider can be moved left or right to a different time location within the video.

## Volume Control

Users can adjust the sound volume of a video or mute it entirely by selecting the sound control. Moving the slider to the right increases the video's sound volume and moving it to the left decreases it.



Video sound is muted by default when a video starts. Selecting the sound control icon mutes the sound of a video.

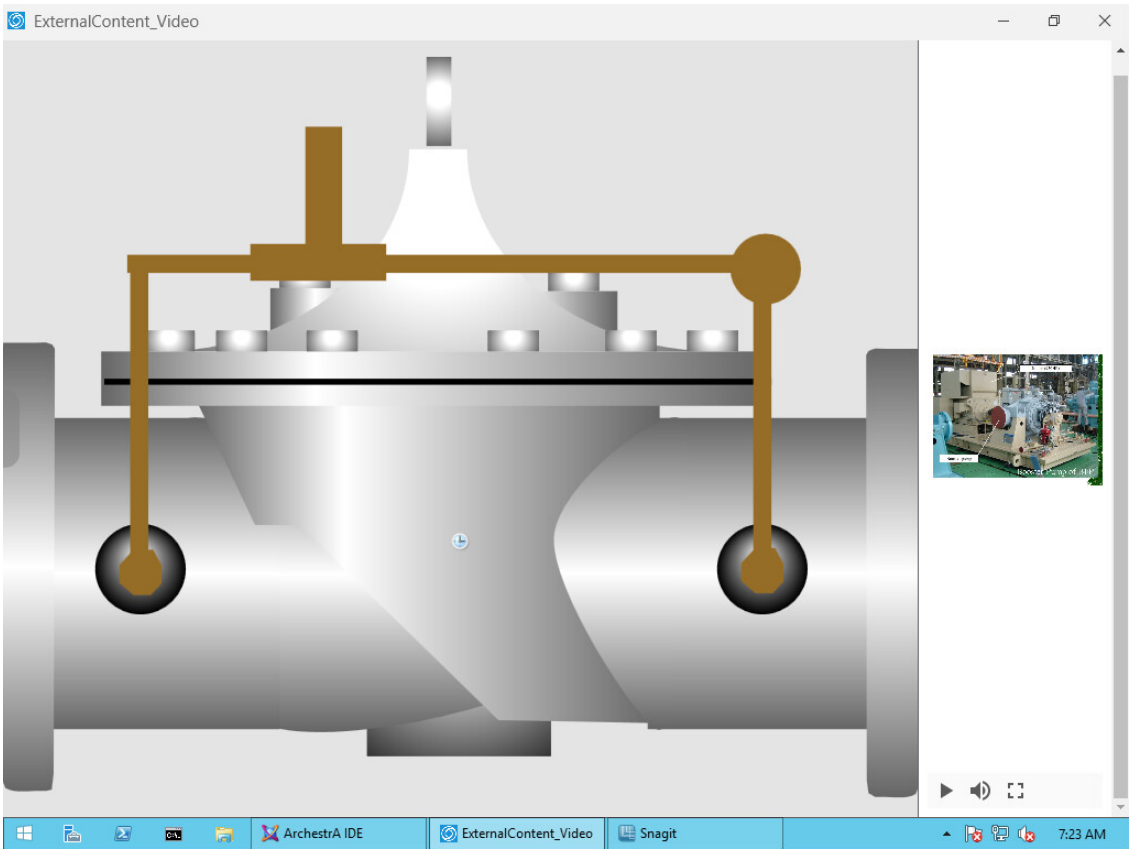


Selecting the sound control icon again restores the sound of the video.

## Playback Video Size

During runtime or in preview mode, the VideoViewerApp initially adjusts the size of the video to play within the dimensions of the containing pane.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

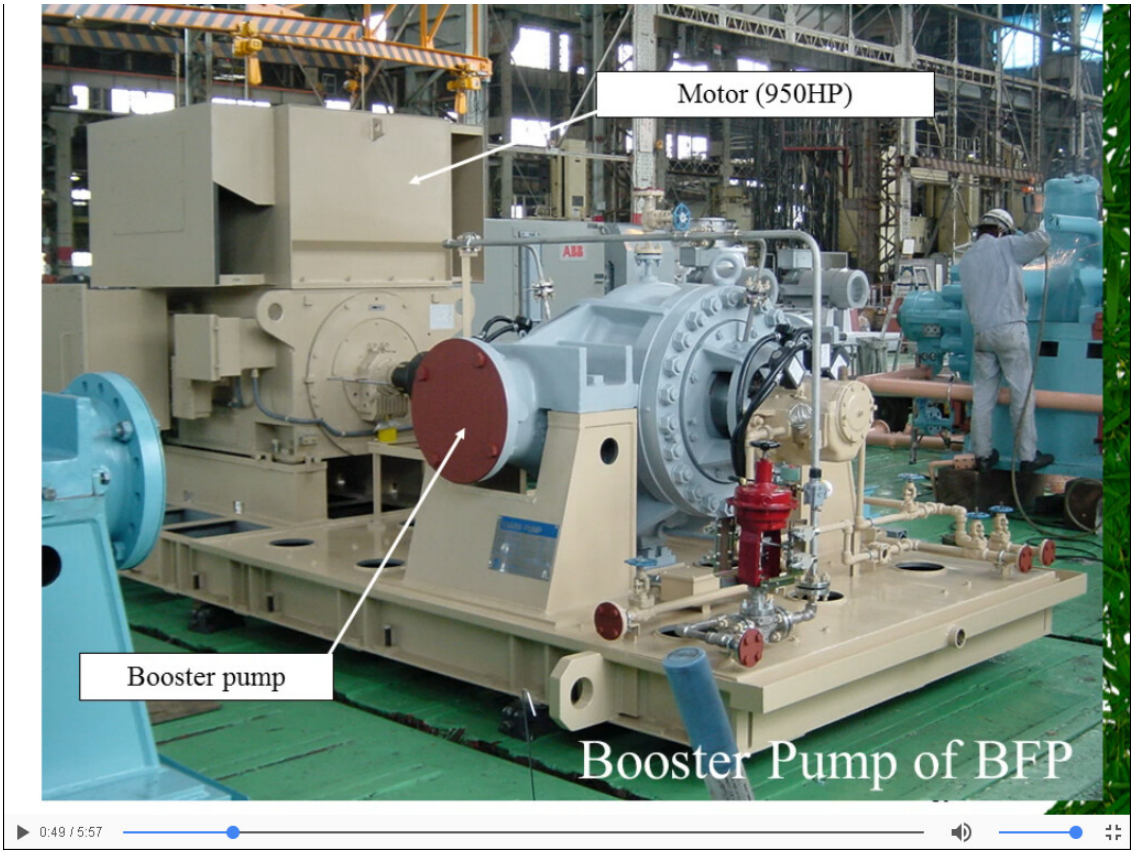



The VideoViewerApp provides the capability to increase the size of a video to full screen size by selecting the full screen icon.



The pane containing the video increases to the full size of the screen.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




Selecting the Esc key returns the video to its original pane size.

## Compatibility of the VideoViewerApp

The VideoViewerApp includes compatibility with current and future versions of System Platform.

- The VideoViewerApp must be imported to a computer running System Platform 2017 Update 3 Service Pack 1. The VideoViewerApp cannot be imported to any other version of System Platform except Update 3 Service Pack 1.
- After the VideoViewerApp is imported to a System Platform 2017 Update 3 Service Pack 1 system, the VideoViewerApp can be migrated to future versions of System Platform InTouch OMI when they become available.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Chapter 15 Configure the VideoViewerApp

The VideoViewerApp can play a video placed on a local computer, a remote computer accessible from a network, or a web site.

You use an External Content item to incorporate a video for playback in a ViewApp. An External Content item is configured during design time to identify the location of the video and its media type.

The External Content item is typically associated with an asset or a user defined object. The asset or object is selected from the **Toolbox** and placed onto a layout pane. During runtime, the user selects an asset associated with a navigation item to view the video.

You can also place a configured External Content item directly onto a layout pane. When the ViewApp starts running or is displayed in preview mode, the video appears in the pane.

The major steps to implement the VideoViewerApp to show a video in a ViewApp are summarized in the following list:

1. Place a video on a computer accessible from your Galaxy or on a web page.
2. Create an External Content item.
3. Configure the External Content item that identifies the location and media type of the video.
4. Associate an External Content item to a symbol or object.
5. Place an asset or symbol on a ViewApp pane associated with the External Content item.

## Before You Begin

If you are placing the video on a remote computer in your network, ensure connectivity between the computer where the ViewApp will run and the computer where the remote video has been saved.

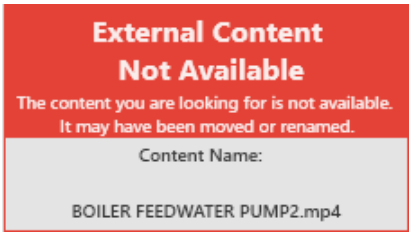
Mapping a network drive is a typical way to connect to a remote computer hosting documents that you want show in a running ViewApp. For this configuration to work successfully, it is important that the computer to which the ViewApp is launched from has the same drive letter mapped to a location having the referenced document.

The VideoViewerApp shows an error message to the user if the specified URI connection to the video file is bad. For more information about the error message, see VideoViewerApp Error Message (see VideoViewer Error Mesage on page 597).

### VideoViewer Error Mesage

An External Content item includes an **URL or URI** option to specify the location of the video to be shown by the VideoViewerApp during runtime or in preview mode. The specified location of the file must be complete and accurate. If the file is moved, deleted, or renamed, the VideoViewerApp shows an error message to the user during runtime, but the ViewApp continues to run.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




# Create an External Content Item

You create an External Content item from the **Graphic Toolbox** of the System Platform IDE. Initially, the External Content item defaults to a set of values that can be changed using the External Content editor.

### To create an External Content item

1. Open the IDE and select the **Graphic Toolbox** tab.
2. Select a toolset folder within the **Graphic Toolbox** if you want to create a new External Content item at a specific location.
3. From the **Galaxy** menu, select **New**, and then **External Content**.

   You can also create an External Content item by other methods:

   - **Keyboard Shortcut**

     Press Ctrl + Shift + C

   - **Accelerator Keys**

     Press Alt + G + N + C

   - **Shortcut Menu**

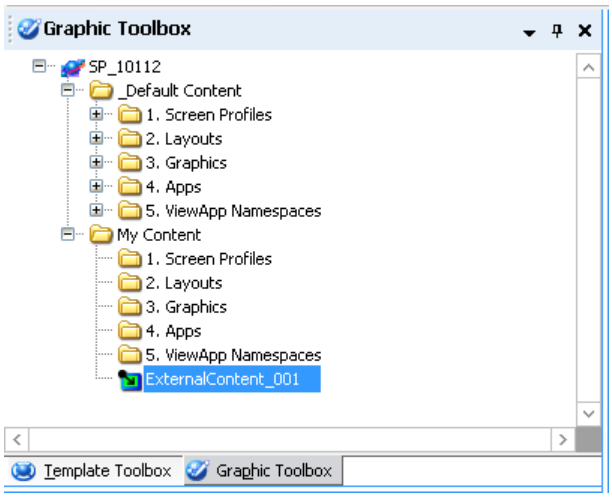
     Right-click on a toolset folder of the Graphic Toolbox to show a shortcut menu. Select the **New** option, and then select **External Content**.

   A new **External Content** item is created in the **Graphic Toolbox.**

   The name of the new item follows a default naming convention of appending a three-digit number to the word ExternalContent.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




4. Rename the External Content item.

After you create an External Content item, it must be configured to specify the remote location of the content and its media type.

## Configure an External Content Item

Each External Content item has three properties that must be assigned values:

- **URL or URI**
- **Media Type**
- **Content Type(s)**

An External Content item is modified from the External Content editor. The editor can be opened by double-clicking on an item from the Graphic Toolbox. Also, an External Content item that has been placed onto a layout pane can be edited from the Layout and ViewApp editors by the selecting the item from the Actions list.

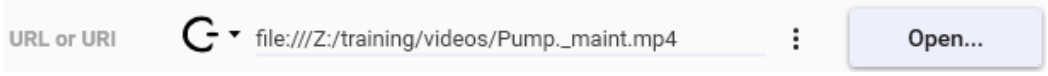
**To configure an External Content Item**

1. Open the IDE and select the **Toolbox** tab to show the External Content items available in the Galaxy.
2. Double click on an External Content item to open within the External Content editor.

   For more information about each field in an External Content item, see Details of the External Content Editor.
3. Enter a URI string or web site URL in the **URL or URI** field where the video is located.

   The value you enter is the location of the external content specified by a URI-formatted string. A media location must be specified.

   You can browse for the document file by selecting the vertical dots icon to the right of the data entry field. A drop-down list includes a **Browse for file** option that enables you to browse your network and select a video file. The **URL or URI** field updates and shows a formatted URI path to the file.




© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

You can also enter a URL to a web site by selecting the **http://** or **https://** options from the drop-down list. The **http://** and **https://** options assist the user when entering URLs by prefixing the URLs with the selection.



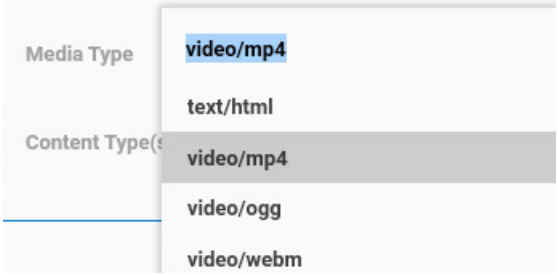

See More Information About Specifying a URI, More Information About Specifying a URI, More Information About Specifying a URI, More Information About Specifying a URI for information about the format of a URI string.

4. Select the **Open** button to validate the URI or URL you entered.

   The **Open** button launches the appropriate application associated with a supported video file type on the computer.

5. Select the type of media associated with the different video file types from the drop-down list of the **Media Type** field.

   The three supported video media types appear in bold text.

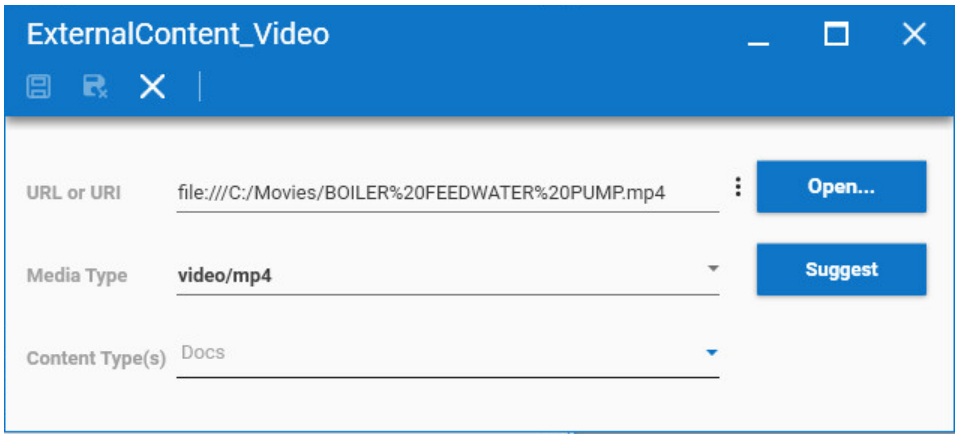



   See More Information About Media Types, More Information About Media Types, More Information About Media Types, More Information About Media Types for more information about supported media types.

6. Select the type of content from the drop-down list of the **Content Type(s)** field.

   The value you enter is used by content-placement algorithms within AVEVA OMI during run time to determine the placement of content when AutoFill or ShowContent calls are invoked.

7. The configured External Content item for a video should be similar to the following screen capture.




8. Save your changes and exit from the External Content item.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Link an External Content Item to an Object or Template

There are three ways to integrate an External Content in a ViewApp.

- Associate an External Content item to an object template, which is described in the following procedure
- Associate an External Content item to a custom navigation item that appears in the navigation model of the ViewApp.
- Place the External Content item on a layout pane, which is the simplest way and is described in Associate an External Content Item to a ViewApp.

### To link an External Content item to an object template

After you have created and configured an External Content item, you can link it to an object template. External Content items can be linked only to objects as opposed to graphics, which can be linked to or owned by an object. All External Content items reside in the Visualization folder. A single External Content item can be linked to multiple objects.

1. Open an object template in the **Object Editor**.
2. Select the **Attributes** tab.
3. In the **Content** pane, select the **Link Content** button.

   The Galaxy Browser opens.
4. Navigate to the folder that contains the **External Content** item to be linked.
5. Select the item, then click **OK**.

   The item is added to the object and appears in the **Content** tab.

   **Note:** After linking an External Content item, you can modify it by selecting it and then pressing the **Edit** button. However, any changes you make will apply to all objects that link to the item.
6. Save your editing changes to the object template and exit from the Object Editor.
7. Create an instance of the of the linked object template.
8. Create a layout which contains pane with a Content Type that matches the content type of the External Content item.
9. Add a navigation tree to the layout
10. Create a ViewApp that incorporates the layout.
11. Deploy the ViewApp.

    In runtime, navigate to the object or any instance created from the template. External Content item will auto-fill the matching pane to show the external content.

# Associate an External Content Item to a ViewApp

You can place an External Content item directly onto a pane from either the Layout or ViewApp editors . External Content items are listed in the **Toolbox** or **Assets** tabs of either editor.

### To associate external content to a ViewApp

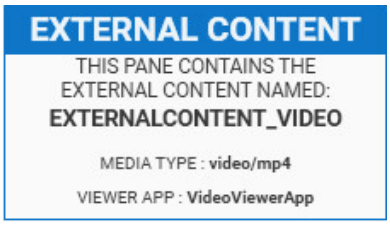
1. Open the System Platform IDE and select the **Visualization** tab to see the list of layouts.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

2. Select a layout that you want to insert external content and open it in the Layout editor.
3. Select the **Toolbox** tab of the Layout editor to show the list of content accessible from the Galaxy.
4. Locate the External Content item you want to place in the layout you selected.

   External Content thumbnails appear beneath of the list of content shown in the **Toolbox** list.
5. Select an External Content thumbnail from the **Toolbox** area, and then drag and drop it onto a pane of a layout incorporated into a ViewApp.

   The External Content thumbnail appears in the pane containing the name of the External Content item, the media type of the external content, and the viewer app that will display the media during runtime. Also, the layout **Actions** area shows the name of the External Content item and the pane that it was placed in.



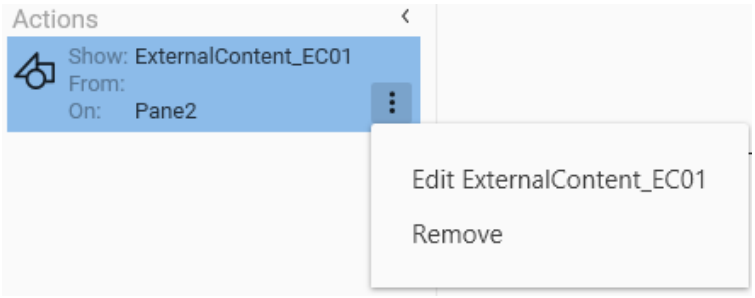

## Editing an External Content Item After Being Placed onto a Pane

An External Content item can be modified after being placed in a layout or a ViewApp, which automatically propagates the changes

### To edit an External Content item in a layout

1. If necessary, open the layout containing an External Content item.
2. Locate the item in the layout **Actions** list.
3. Select the **Options** icon shown at the right of the item in the **Actions** list.

   A drop-down list shows an Edit External Content command.




4. Select the **Edit** command.

   The External Content editor opens the item for editing.
5. Update the values assigned to the item and save your changes.

   The External Content thumbnail placed in a pane updates to reflect the changes made to the item.

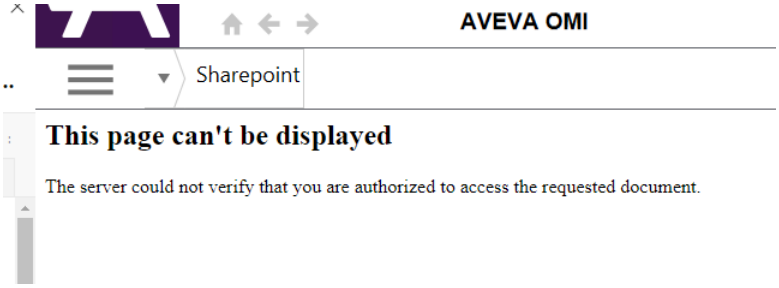
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# WWWebAppControls

AVEVA OMI provides a set of controls to show web-based content within a running ViewApp. WWWebAppControls includes two web controls, **Sharepoint** and **WebBrowser**, that you can add to a layout.

With web-based content, the destination server determines how requests for data are processed. The credentials for the current logged-in Windows user are used to access the server. Therefore, you may have to change the internet properties of the computer running the ViewApp to allow automatic logon with the current user.

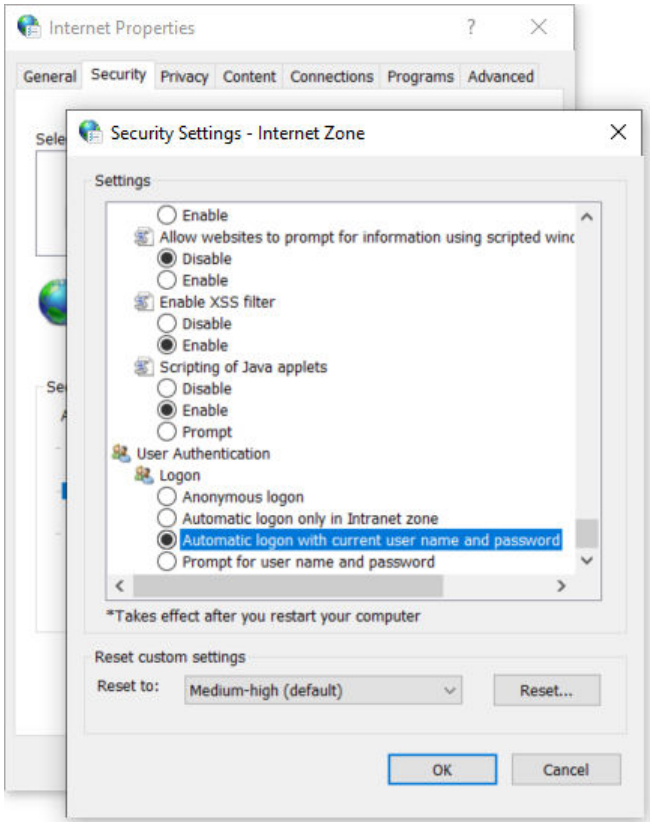
If you get a message that you cannot access content in the Sharepoint app, WebBrowser app, or other app that uses web controls, you may need to change the web security settings on your computer.




**To change internet security settings:**

1. Open Windows **Internet Options**.
2. On the **Security** tab, select **Internet** zone, then select **Custom Settings**.
3. Scroll to **User Authentication**.
4. Change the logon setting to **Automatic logon with current user name and password**. The default setting for this zone is "Automatic logon only in Intranet zone."

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




- **SharePoint**

  SharePoint is a web-based application that integrates with Microsoft Office and primarily functions as a document management and collaboration tool. SharePoint is highly configurable and its usage varies substantially between organizations.

  **Note**: Configure SharePoint permissions to enable users to open and immediately show data in a running ViewApp. Otherwise, a message appears during run time asking users to log on to Sharepoint before viewing any content. In this document, SharePoint (with capital P) refers to the Microsoft Office application. **Sharepoint** (lowercase p and bolded) refers to the OMI app.

- **Web browser**

  AVEVA OMI includes a full-featured standards-compliant web browser, which supports WinForms and WPF apps. The web browser is based on Chromium Embedded Framework (CEF), the open source version of Google Chrome.

  **Note**: Place the WebBrowser app in a sufficiently large ViewApp pane to reduce user scrolling to view web content.

## Configure a Web Control

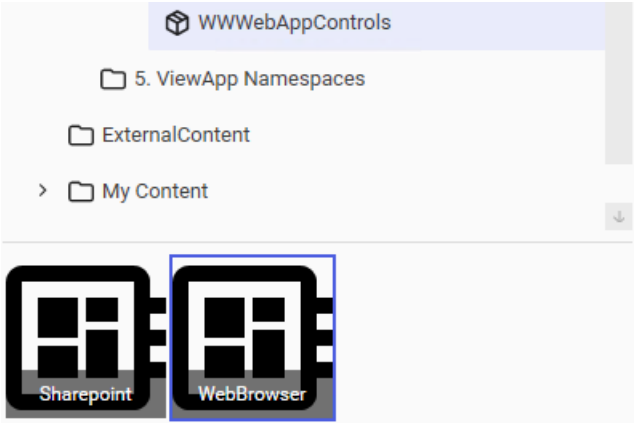
All web controls include a similar **Address** property to assign the URL or IP address of a web server that provides the data shown by the Web control.

**Important**: You should complete all user security or authentication tasks before configuring the web control.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

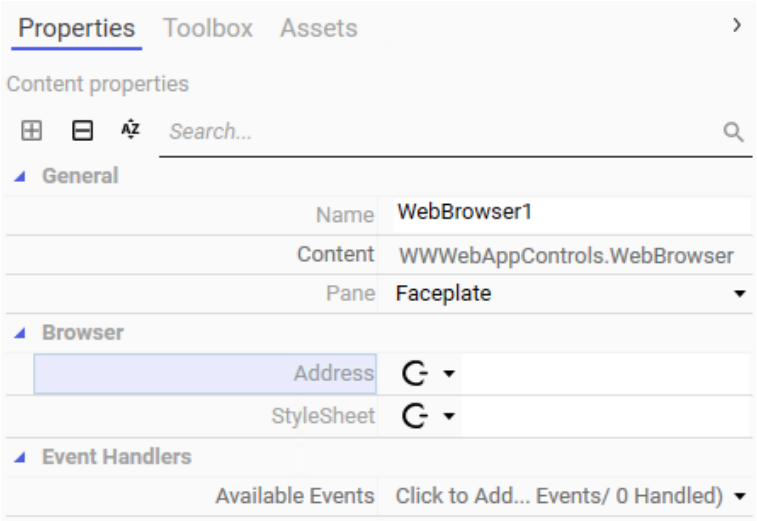
### To configure the Web control properties

1. Open the Layout or ViewApp Editor and show the items listed in the **Toolbox** tab.
2. Select WWWebAppControls from the **Toolbox** list to show its preview thumbnails.




3. Select the preview thumbnail of the web control that you want to place in your ViewApp.
4. Drag and drop the thumbnail on to a layout pane.
5. Select the pane containing the web control and select the **Properties** grid.

   The **Properties** grid shows the **Address** property.




6. Enter the URL of the computer providing data for the Web control.

   You can configure a static or dynamic URL.

| | |
|---|---|
| **Constant** | Static binding to the specified URL. Enter the URL in the data field of the **Address** property. |
| **In** | Dynamic URL with read only binding by the control to a reference. |
| **Out** | Dynamic URL with write only binding by the control to a reference. |
| **InOut** | Dynamic URL with read/write binding by the control to a reference. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| **Reset** | Reset the **Address** property to remove any specified URL. |

7. If you want to create event handler scripts, select the **Available Events** data entry field to show a list of events. For more information about creating event handler scripts, see Add an Event Handler Script.
8. Save your changes.

## Using AuthenticationProviders Mode with WebAppControls

The security mode for OMI apps is set by the app developer. Most of the default apps bundled with System Platform use OS User or OS Group security (Kerboros-based) for user authentication.

A new authentication mode, AuthenticationProviders, has been added in System Platform 2023. App developers can override this setting to allow multiple authentication modes for their custom apps. However, the authentication mode must be explicitly set for the app. See WebControls SDK in the *OMI SDK Help* for more information.

### Sharepoint App

When AuthenticationProviders security mode in implemented, the **Sharepoint** control does not necessarily follow the security mode implemented by the ViewApp, which uses the security mode set in the System Platform IDE. As a result, users may see their Azure AD credential shown in the **Sharepoint** pane, but their Kerberos credentials will be shown for the ViewApp logged-in user.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Client Controls

The following client controls are available:

- The Alarm Client Control
- The Trend Client
- The SQLDataGrid Graphic

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Chapter 16 The Alarm Client Control

The Alarm Client Control is a graphical element you can use in your Industrial Graphics to show current and historical alarms and events.

The Alarm Client Control replaces the Alarm Viewer control and Alarm DB View control in the InTouch® HMI and extends alarm visualization to the Industrial graphics environment.

You can place the Alarm Client Control directly from the **Tools** panel in the **Industrial Graphic Editor** onto the canvas. You can customize it to your needs by adding further graphics, interactions, and scripts.

You can deploy a managed InTouch application containing Alarm Client Controls to a remote node and visualize and interact with alarms at run time with InTouch WindowViewer.

For this documentation, the Alarm Client Control is simply referred to as "Alarm Control."

## Client Modes

The Alarm Client Control supports five different client modes, which can be grouped depending on their data source. The Alarm Control supports an ArchestrA Database (A2ALMDB), and the Historian History Blocks.

### InTouch Alarm Manager

The Alarm Control manages currently active alarms (summary alarms) and recent alarms (historical alarms). These types of alarms are saved to internal alarm memory.

#### Current Alarms

When the Alarm Control is showing alarms in "Current Alarms" mode, it is showing currently active alarms directly from the Alarm Manager.

#### Recent Alarms and Events

When the Alarm Control is showing alarms in "Recent Alarms and Events" mode, it is showing historical alarms and events stored in Alarm Manager.

Unlike the "Current Alarms" mode, the "Recent Alarms and Events mode" shows time point data, such as alarm transitions and events, instead of continuous conditions.

When the Alarm Client Control is in the Recent Alarms and Events mode, the displayed alarms cannot be acknowledged.

### Alarm and Event Storage

Alarms and events can be stored to the ArchestrA alarm database (A2ALMDB) or the Historian history blocks.

When the Alarm Control is configured in "Historical Alarms" mode, only alarms stored in the Alarm Database are shown.

When the Alarm Control is configured in "Historical Events" mode, only events stored in the Alarm Database are shown.

When the Alarm Control is configured in "Historical Alarms and Events" mode, both alarms and events stored in the Alarm Database are shown.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Switching Between Client Modes

The client mode and many other features are controlled by properties and methods.

By default, the Alarm Control is set to show current alarms. You can also change the client mode at run time by using the Alarm Control properties.

## Using the Alarm Control in Industrial Graphics

You can use the Alarm Client Control as a faceplate so that when the operator clicks an icon, an Alarm Client Control showing a specific alarm area opens.




You can also configure the Alarm Client Control to interact with the Galaxy namespace and other Industrial graphics by mapping its properties to application server attributes and symbol elements.

The Alarm Control can be placed into Industrial Graphics hosted by Automation Object templates and instances. You can configure them to retrieve alarms from their hosting Area object or their hosting Automation object.

## Alarm Acknowledgement

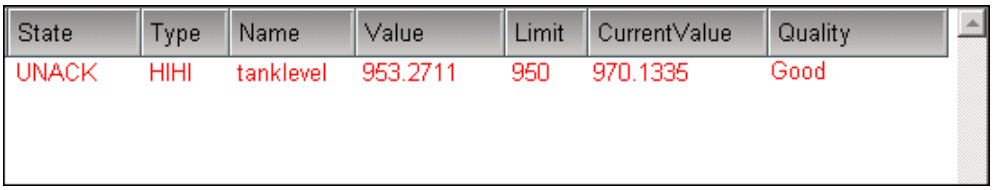
You can configure the Alarm Control to require an alarm to be acknowledged even if the condition causing the alarm has passed. This ensures that an operator is aware of events that caused a temporary alarm state but have returned to normal.

You acknowledge alarms at run time using a shortcut menu or through script methods.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

## Current Value and Quality Display

The Alarm Control in one of the current client modes shows continuously the current value and quality of a tag or attribute in alarm state.




You can see the current value and quality of tags or attributes in alarm from:

- InTouch running on the local computer
- Galaxy namespace

**Note:** You cannot see current value and quality data from InTouch tags running on a remote computer.

## Working With Alarm Queries and Filters

Queries and filters are two methods to retrieve data at **RunTime**, with queries being a superset of filters. You can run a query at run time to retrieve data, then run another query to narrow the search criteria without re-running the query or retrieving the same data. This allows the Alarm Control to use data from a current subscription without re-subscribing. For more information, see Filter Alarms.

## Alarm Queries

The Alarm control supports standard Galaxy alarm query formats, such as:

```
\galaxy!Area_001
```

Alarm query syntax is the same for both Current Alarms Mode and Recent Alarms and Events Mode. Queries in Historical Alarms, Historical Events, and Historical Alarms and Events Modes are actually Alarm Database queries, which follow rules and syntax for SQL Server database queries.

The alarm query syntax changes when you use the run-time alarm comment language switching feature.

The Alarm control also supports relative references for Galaxy alarms in alarm queries. For all alarm modes, relative references are resolved at run time at the point of query to the Alarm Manager or Alarm Database.

You must put the reference part of the alarm query between less-than (<) and greater-than (>) characters.

The following table shows examples of alarm queries.

| Alarm Query | Description |
|---|---|
| \provider!group | Shows all alarms from the given provider and group. For example: `\intouch!Group_A` |
| \provider!group!tagname | Shows all alarms from the given provider, group and tag. For example:<br>\galaxy!Mixing_Area!RotorCtrl |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Alarm Query | Description |
|---|---|
| \provider!group | Shows all alarms from the given provider and group. For example: `\intouch!Group_A` |
| \\node\provider!group | Shows all alarms from the given provider and group from a given node. For example: `\\remote\intouch!Group_B` |
| \\node\provider!group!tagname | Shows all alarms from the given provider, group and tag from a given node. For example: `\\grnode\galaxy!Packaging_Area!Wrapper1` |
| HotBackupName | Shows all alarms from primary or backup alarm provider as configured in the Hot Backup Manager. |
| \galaxy!<me.Area>!<me.tagname>.* | Shows all alarms from the Automation Object. Alarms from other Automation Objects in the same area are ignored. |
| \galaxy!<myArea.tagname><br>or<br>\galaxy!<me.Area> | Shows all alarms from the Area object hosting the Automation Object |
| \galaxy!<myPlatform.tagname> | Shows all alarms from the Winplatform object hosting the Automation Object. |
| \galaxy!<me.area>!<myContainer.tagname>.* | Shows all alarms from the container Automation Object. At run-time the Alarm Control resolves the Container attribute to detect the container. |
| \galaxy!<myEngine.tagname> | Shows all alarms from the AppEngine object hosting the Automation Object. At run-time the Alarm Control resolves the MyEngine attribute to detect the host. |

## Alarm Query Syntax when Register Using Galaxy_<GalaxyName> is Enabled

The run-time alarm comment language switching feature requires slightly different alarm query syntax. In the WinPlatform object, when you enable InTouch alarm provider, you can enable **Register using Galaxy_<GalaxyName>** instead of Galaxy.

This option will register the platform to the alarm subsystem using the Galaxy name preferred by "Galaxy_" instead of just the word "Galaxy". This allows an InTouch application to monitor alarms from multiple Galaxies and avoid name conflicts.

Syntax changes slightly when Galaxy_GalaxyName is enabled:

- Use \\ for computer name

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- Use \ for Galaxy or Galaxy_<GalaxyName>
- Use ! for Area

For example: \\Galaxy\MyGalaxy!Area001

If Galaxy_GalaxyName is not enabled in WinPlatform, then the default behavior described in Alarm Queries applies.

You can determine if Galaxy_<GalaxyName> has been enabled by monitoring the run-time attribute of the platform ITAlarmProvider.ProviderNameAsGalaxyNameEnabled.

# Alarm Filtering

The Query Favorites of InTouch Alarm Viewer control define a set of alarm provider, alarm group, an optional node name, and a priority range under one name. The alarm provider, alarm group, and the node name are used for subscribing to a specific alarm group. The priority range on the other hand is used to filter the alarms from the given alarm group.

The Filter Favorites of InTouch Alarm DB View control define a set of any number of criteria you want to filter from the Alarm Database under one name.

In summary, Filter Favorites fulfill a purely filtering function whereas Query Favorites fulfill a subscription and a filtering function at the same time.

The Alarm Control filtering feature unites both these concepts by exclusively using filter conditions and subscribing to the necessary alarm providers on demand.

Filters can be saved and used in both run time and historical modes.

The filter conditions can be re-used between different client modes. For example, if you define node name, provider name, alarm group, and a priority range for the current alarms, you can also use this filter to retrieve the historized alarm data of the same source from the Alarm Database instead.

Filter definitions will be saved per user so operators working on the same server can access different saved filters.

## Alarm Queries to Filters Translation

You can define queries for current alarms in the \\node\provider!group format, but they are translated by the Alarm Control to a filter after you save.

For example, the query string \\GRNode\galaxy!MixingArea is translated to the following filter string:

Node = ‘GRNode’ AND Provider=’galaxy’ AND Group=’MixingArea’

You can modify the filter in a tree to query only alarms in the priority range 1 to 250, such as:

```
AND
   Node = ‘GRNode’
   Provider = ‘Galaxy’
   Group = ‘MixingArea’
   Priority >= ‘1’
   Priority <= ‘250’
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Alarm Shelving

Operators can temporarily shelve selected alarms from the list of an Alarm Control's active alarms. A shelved alarm is suppressed and removed from the list of active alarms. Typically, operators shelve lower severity nuisance alarms because they provide little diagnostic value and interfere with the operator's ability to manage a plant process.

An alarm is shelved for a specified period. After the period ends, alarms are automatically unshelved and appear again in the list of active alarms. Operators can also manually unshelve an alarm before the end of the specified shelved period.

By default, Medium and Low severity alarms are enabled for shelving. Critical and High severity alarms are not because of the potential risk of shelving and ignoring alarms that represent serious operating states. For more information about enabling shelving based on alarm severity, see Enabling Alarm Shelving in the *Application Server Help*.

## Shelving Alarms During Run Time

When shelving an alarm from the Alarm Control, operators set an associated time period in which the alarm remains shelved and enter a mandatory comment. Operators can select from a list of Alarm Control Context commands during run-time to:

- Shelve one or more selected alarms
- Shelve all alarms
- Shelve only those alarms visible in the Alarm Control
- Shelve all alarms within the same alarm group as an alarm selected from the Alarm Control
- Shelve alarms by selected tags or attributes
- Shelve alarms by selected alarm priorities
- Shelve all alarms that have the same severity as an alarm selected from the Alarm Control

For more information about configuring shelve Context commands, see Configuring the Run-Time Shortcut Menu

When application security is used, alarms can be shelved and unshelved only by operators with proper authorization. For more information about setting shelving authorization, see Configuring the Alarm Control to Require a SHELVE Signature.

## Unshelving Alarms During Run Time

Alarms are unshelved automatically at the end of the shelving time period. An unshelved alarm reappears in the Alarm Control active list and resumes its state at the time it was shelved. Operators can manually unshelve a shelved alarm before the end of the shelved period and enter an optional comment.

# Alarm Hiding

The "hiding" and "unhiding" of alarm records is known in the corresponding InTouch alarm controls as "suppressing" and "unsuppressing".

When the Alarm Control is hiding alarms, it ignores certain alarms. If an alarm matches the exclusion criteria, it is not visible.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

The actual alarm generation is completely unaffected by hiding. Alarm records are still logged into the alarm history.

As in the InTouch HMI, you can unhide specific alarms and also use properties and methods to interact with the alarm hiding feature at run time.

## Alarm Control Grid Freezing

You can freeze the Alarm Control to prevent the Alarm control tree from being updated with any further changes.

For example, if new alarms occur while the Alarm Control is frozen, the new alarms are only shown after you unfreeze the Alarm Control.

You can configure a time period after which the Alarm Control automatically unfreezes to avoid the Alarm Control being unknowingly frozen. For example, the operator leaves the workstation and returns without realizing that the Alarm Control is still frozen.

The Alarm Control unfreezes automatically if one of the following changes:

- Alarm Mode
- Alarm Query
- Filter

## Alarm Sorting

Like InTouch alarm controls, you can sort the alarms in ascending or descending direction for selected columns.

The Alarm Control supports alarm sorting for up to four columns at design time and run time. At run-time, the operator can configure sorting of even more columns by clicking on the column headers of the Alarm Control while pressing the Shift key.

## Support for a Redundant Historian Server

A Historian may be configured to have a symmetrical "partner" Historian that can be used as a backup if the primary, or main, historian is not available. This is known as a "redundant historian" setup. No control configuration is required to take advantage of a redundant historian.

When the primary historian is unavailable, the Alarm Control automatically switches over to the configured partner historian. The control remains connected to the partner historian, even when the primary historian becomes available again. The Alarm Control switches back to an available primary historian if it fails to connect to the partner or during a new attempt to connect to the primary historian. One example of this would be restarting the Trend Control, which initiates a new connection to the primary historian. For a redundant historian setup, both historians must be configured to store events to the same location, either to history blocks or the A2ALMDB database.

When the Alarm Control successfully connects to either the primary historian or its partner, the following columns are updated with the connected historian server name in the tags list of the selected tags:

- Server
- I/O Address

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

The historian name shown in the Tag Picker is always the name of the primary historian, even when the control is connected to the partner.

There is no automatic synchronization built in to the redundant historian setup; it is up to the historian server administrator to make sure that the two historians in the pair are symmetrical and synchronized.

If the SQL Server Service is running while Historian Service is not running, this is not recognized by the Alarm Control as a scenario in which the Historian Server is unavailable.

## Status Bar

The status bar of the Alarm Control resembles the status bars of the InTouch alarm controls, with the following differences:

- Alarm Control also shows the alarm client time zone
- Alarm Control querying the Alarm Database has a Requery button to more easily retrieve data from the Alarm Database
- Alarm Control shows the current client mode as an icon

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Configure the Alarm Client Control

This section shows you how to place an Alarm Client Control onto the canvas and configure it. You can configure it either with the Edit Animations dialog box, or by changing individual properties in the Properties Editor.

## About Configuring the Alarm Control

After placing the Alarm Control onto the canvas, you can configure the:

- Client Mode to show current alarms, recent alarms and events, or historical alarms and/or events.
- Colors for the Alarm Control grid, window, heading, and alarm records.
- Order and width of the grid columns and their headers.
- Sorting order of alarm records.
- Filtering for alarm records and save the filters as favorites for re-use.
- Time format and zone for the alarm record time stamps.
- Run-time behavior for the Alarm Control, such as:
  - If the operator can resize columns or select multiple records at run time.
  - Access to specified options of the shortcut menu at run time.

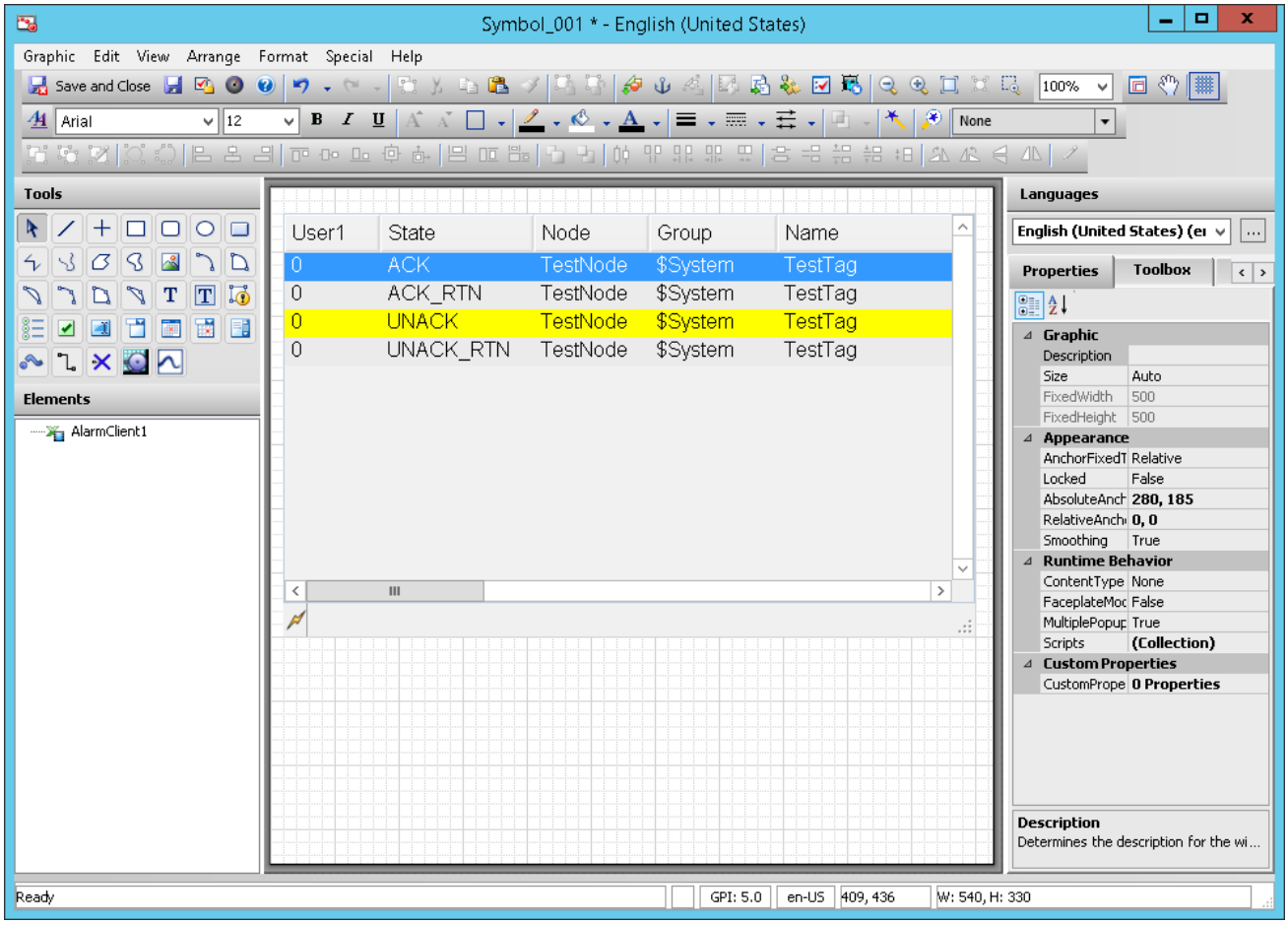
## Placing the Alarm Control into an Industrial Graphic

You can easily place the Alarm Control into an Industrial Graphic by placing it onto the canvas.

**To place the Alarm Control into an Industrial Graphic**

1. Open the Industrial graphic in the **Industrial Graphic Editor**.
2. On the **Tools** panel, click the **Alarm Client** icon. The cursor appears in insert mode.
3. Click the canvas where you want to place the Alarm Control.

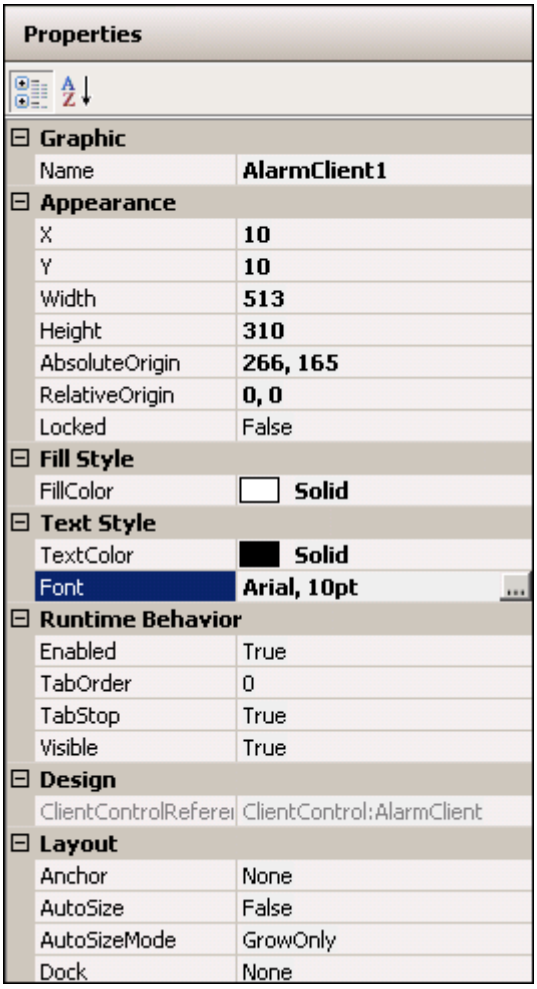
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




## Setting Alarm Control Properties

Like all other graphical objects in the Industrial Graphic Editor, you can set some of the properties of the selected Alarm Control directly in the Properties Editor.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




We recommend you configure the Alarm Control with the **Edit Animations** dialog box and only use the **Properties Editor** to edit the configuration afterward.

## Showing Current Alarms or Recent Alarms and Events

You can set the Alarm Control to show either of the following:

- Current alarms
- Recent alarms and events

You use the ClientMode Property integer property in scripting to switch the Alarm Control to show current alarms or recent alarms and events at run time.

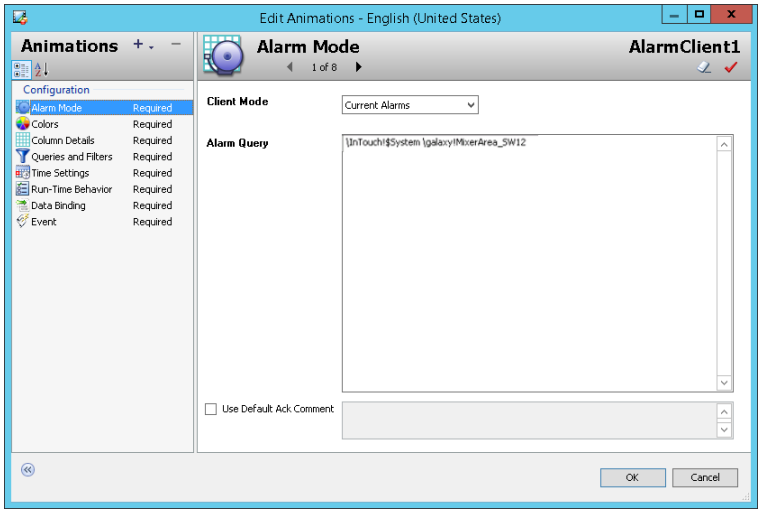
You can also configure a comment to use when alarms are acknowledged at run time. Use the AckComment.UseDefault Property Boolean property and AckComment.DefaultValue Property string property in scripting to use a default acknowledgement comment at run time.

**Note:** When the Alarm Client Control is in the Recent Alarms and Events mode, the displayed alarms cannot be acknowledged.

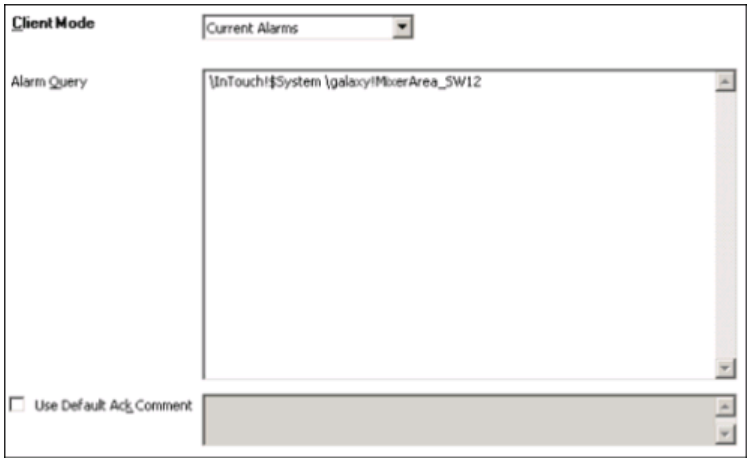
### To show current alarms

1. Double-click the Alarm Control on the canvas. The **Edit Animations** dialog box appears.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




2. If necessary, click **Alarm Mode**. The **Alarm Mode** page appears.

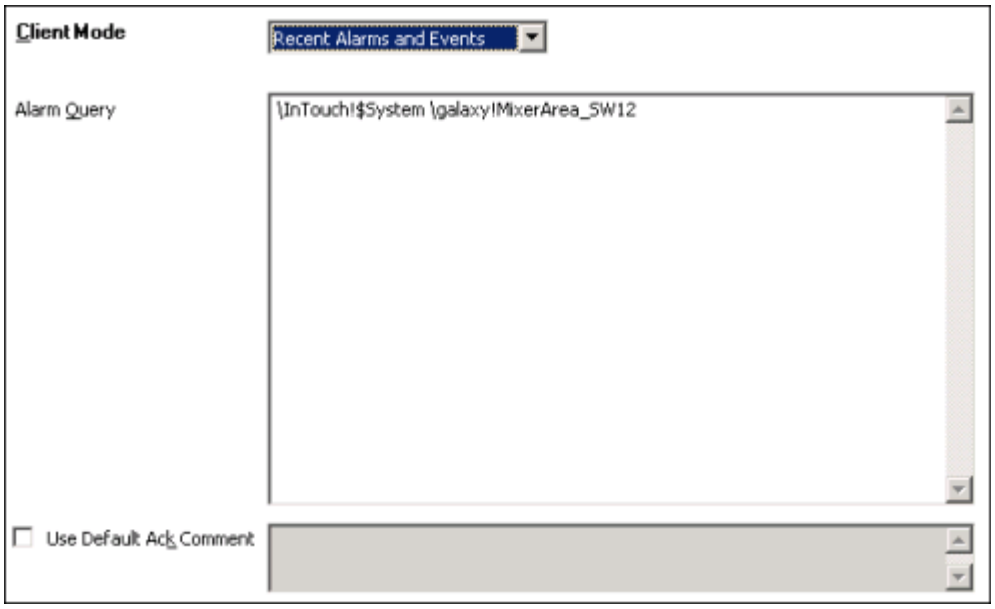



3. In the **Client Mode** list, click **Current Alarms**.
4. In the **Alarm Query** box, type the alarm query. To create a new line in the Alarm Query box, press **Ctrl + Enter**. For more information on the valid syntax, see Alarm Queries.
5. If you want to use a default acknowledgement comment, select the **Use Default Ack Comment** check box and type a comment in the text box.
6. Click **OK**.

### To show recent alarms and events

1. Double-click Alarm Control on the canvas. The **Edit Animations** dialog box appears.
2. Click **Alarm Mode**. The **Alarm Mode** page appears.
3. In the **Client Mode** list, click **Recent Alarms and Events**.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




4. In the **Alarm Query** box, type the alarm query. To create a new line in the **Alarm Query** box, press **Ctrl + Enter**.

   The alarm query must follow one of the following syntax:

   - \\node\provider!group
   - \provider!group
   - HotBackupName

   For example:

   ```
   \galaxy!Area_001
   ```

   For Alarm Controls hosted by Automation Object templates or instances, you can specify one of the following alarm queries:

   - \galaxy!<myArea.Tagname> to retrieve alarms and events from the Area object hosting the Automation Object template or instance.
   - \galaxy!<me.Area>!<me.Tagname>.* to retrieve alarms and events from the Automation Object template or instance.

   For more information on alarm queries, see Alarm Queries.

5. If you want to use a default acknowledgement comment, select the **Use Default Ack Comment** check box and type a comment in the text box.
6. Click **OK**.

## Showing Historical Alarms and/or Events

You can set the Alarm Control to show one of the following:

- Historical alarms from the Alarm Database
- Historical events from the Alarm Database
- Historical alarms and events from the Alarm Database

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- Historical events from History Blocks
- Historical alarms from History Blocks
- Historical alarms and events from History Blocks

When you configure the Alarm Control to show historical alarms and/or events, you also configure the following:

- Server name hosting the Alarm Database
- Authentication information to connect to the Alarm Database
- Maximum number of records to retrieve from the Alarm Database
- Time range or duration to show in the Alarm Control
- If the Alarm Control should update to the current client time

Alarm Control works with both the ArchestrA Database (A2ALMDB) and with History Blocks.

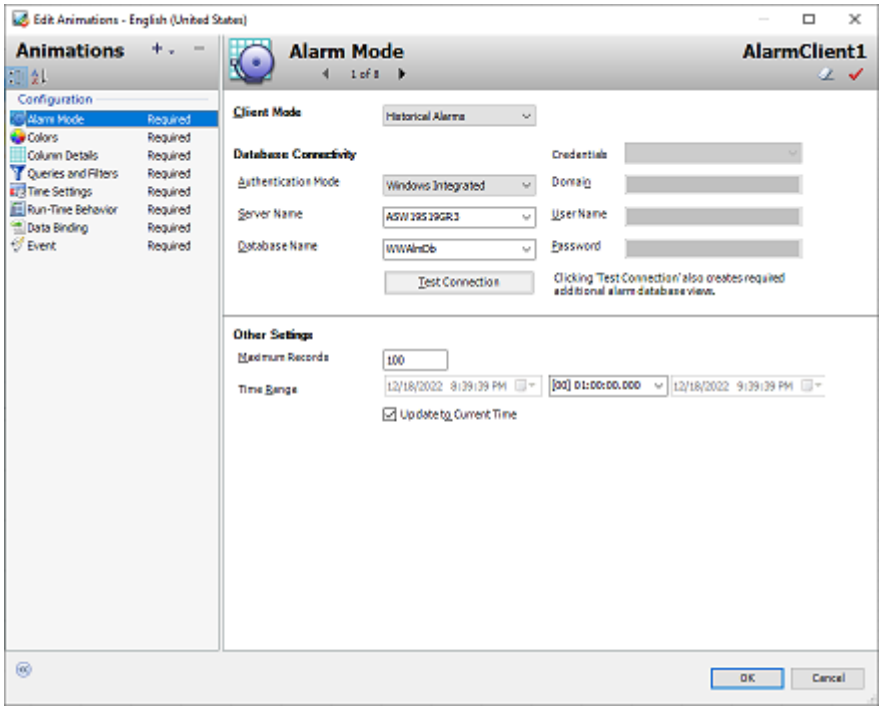
Use the following properties in scripting to switch the client mode and configure the database connection, such as:

- ClientMode Property
- Database.Authentication Property
- Database.Name Property
- Database.Password Property
- Database.ServerName Property
- Database.UserID Property
- Domain Property

### To show historical alarms and/or events

1. Double-click the Alarm Control on the canvas. The **Edit Animations** dialog box appears.
2. Click **Alarm Mode**. The **Alarm Mode** page appears.
3. In the **Client Mode** list, click:
   - **Historical Alarms** to only show alarms from the Alarm Database. No events are shown
   - **Historical Events** to only show events from the Alarm Database. No alarms are shown
   - **Historical Alarms and Events** to show both alarms and events from the Alarm Database

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




4. In the **Authentication Mode** list, click one of the following:
   - **Windows Integrated** to use the authentication of the currently logged-on Windows user
   - **Windows Account** to use a given Windows user authentication
   - **SQL Server** to use SQL Server authentication mode
5. In the **Server Name** list, either select or type the name of the server hosting the Alarm Database.

   Provide the port number with the server name when connecting to a non-default port. For example: <servername>,23646. The port number can be changed in the Configurator.
6. In the **Database Name** box, type the name of the Alarm Database. For the ArchestrA Database, enter A2ALMDB, and for Historian block storage enter History Blocks.

   For the History Blocks option to function correctly, the REST Details > HTTP port (Default 32569) and HTTPS port (Default 32573) on the Historian Server needs to be opened in the firewall, and configured for both inbound and outbound traffic. For more information, see the Configuring Databases and Data File Locations in the System Platform Installation Guide.

   **Note:** For History Blocks, select Windows Integrated or Windows Account as the authentication mode.
7. From the **Credentials** drop-down, select the credentials for authentication.The Credentials field is enabled only when you select **Windows account** or **SQL Server** authentication type. The Windows Integrated authentication method uses the credentials of the user currently logged in, and disables the Credentials field.

   **Note:** For standalone InTouch applications, the credentials are retrieved from the Application Manager. For managed InTouch applications, the credentials are retrieved from the Credential Manager of the Application Server. For more information, see Work with Credential Manager in the AVEVA™ InTouch HMI Application Development Guide.

   You can also select **Use username and password** to enter the credentials.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

a. If you are using **Windows Account** authentication mode, type the domain, user name, and password in the **Domain**, **User Name** and **Password** boxes.

b. If you are using **SQL Server** authentication mode, type user name and password in the **User Name** and **Password** boxes.

8. Click **Test Connection**. The connection to the Alarm Database is tested and a result message appears. If necessary, check your authentication information.

   If the Historian requires a secure connection and the client is not configured with the correct certificates, then an error message is displayed.

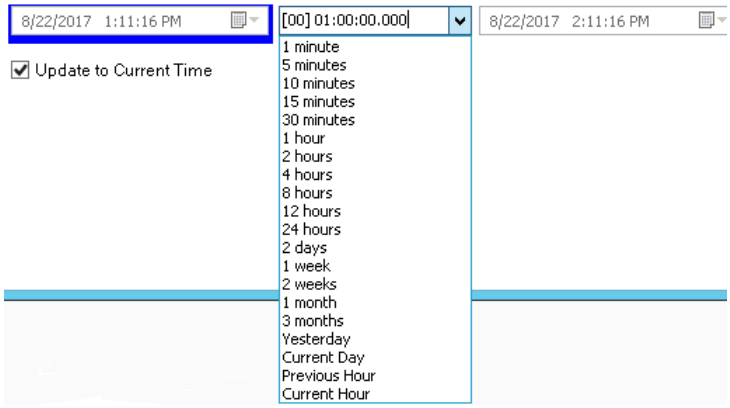
9. Click **OK**.

### To set maximum records and time range

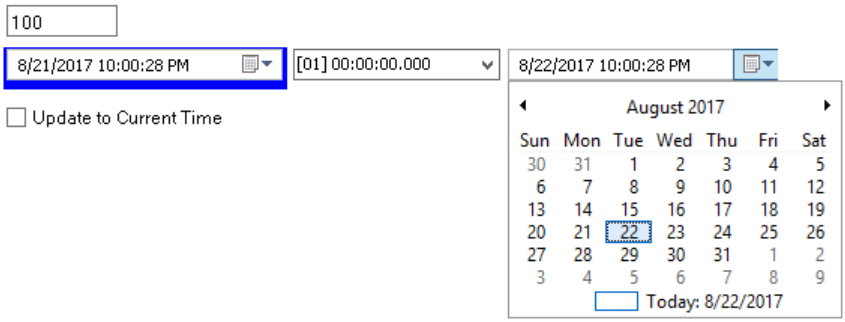
1. Double-click the Alarm Control on the canvas. The **Edit Animations** dialog box appears.
2. Click **Alarm Mode**. The **Alarm Mode** page appears.
3. Make sure the **Client Mode** is set to **Historical Alarms**, **Historical Events**, or **Historical Alarms and Events**.
4. In the **Maximum Records** box, type the number of records to view from the control at one instance. The valid range of maximum records is from 1 to 32766.

   You can also use the MaxDatabaseRecords Property in scripting to set the maximum records at run time.

5. To use a pre-defined time interval, select an interval from the middle list of the **Time Range** pickers.




6. To use a specific start time and end time, clear **Update to Current Time**, and select the start time from the list at the left and the end time from the list at the right of the **Time Range** pickers.




   You can also use the **TimeSelector.*** methods and properties in scripting to set the start date, end date, or duration at run time. For more information, see TimeSelector Property.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

7. Click **OK**.

## Set Alarm Control Colors

You can show different types of alarm records with different colors to more easily identify certain types of alarms.

You can configure the Alarm Control with priority breakpoints to show alarm records within the resulting priority ranges in different colors.

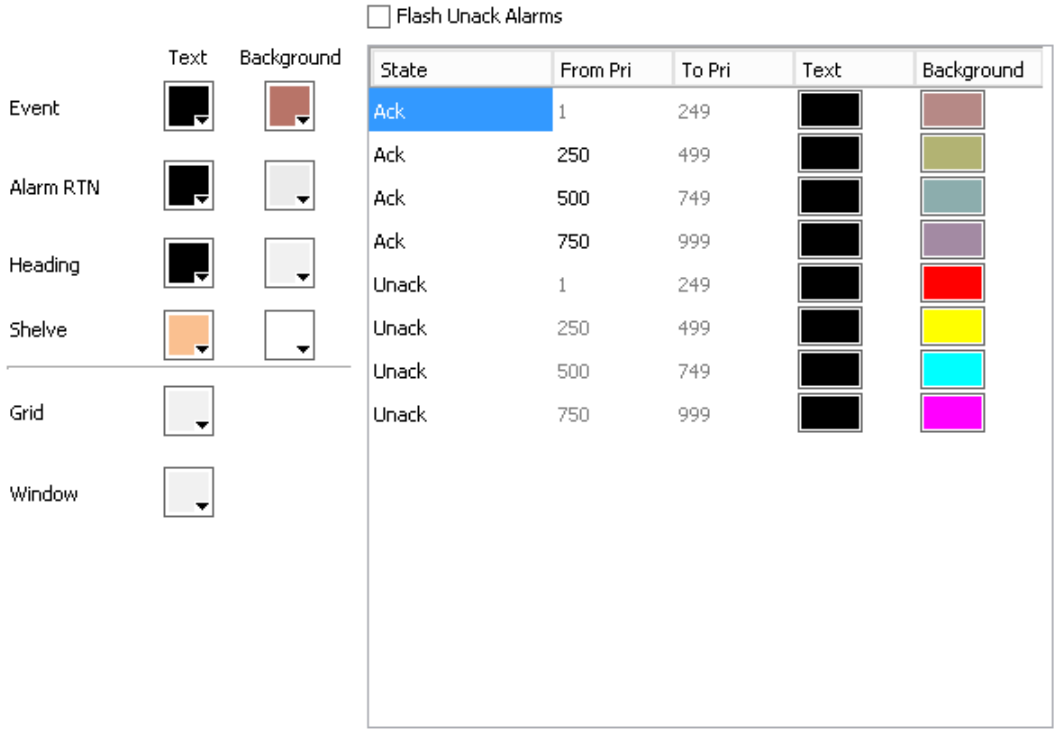
You can also configure the control background color, the grid color, and the heading colors.

### Set Event Record Colors

You can set text color and background color for event records. Use the EventColor.ForeGround Property and EventColor.BackGround Property properties in scripting to set the event alarm record text color and background color at run time.

#### To set text and background colors for event records

1. Double-click the Alarm Control on the canvas. The **Edit Animations** dialog box appears.
2. Click the **Colors**. The **Colors** page appears.




3. Configure the event record text color. Do the following:
   a. Click the color field next to **Event** and under **Text**. The color picker appears.
   b. Select a color and click **OK**.
4. Configure the event record background color. Do the following:
   a. Click the color field next to **Event** and under **Background**. The color picker appears.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

b. Select a color and click **OK**.

5. Click **OK**.

### Set Alarm Return To Normal Record Colors

You can set text color and background color for "return to normal" alarm records. Use the AlarmColor.Ack.RTN.ForeGround Property and AlarmColor.Ack.RTN.BackGround Property properties in scripting to set the "return to normal" alarm record text color and background color at run time.

#### To set text and background colors for "return to normal" records

1. Double-click the Alarm Control on the canvas. The **Edit Animations** dialog box appears.
2. Click **Colors**. The **Colors** page appears.
3. Configure the "return to normal" record text color. Do the following:
   a. Click the color field next to **Alarm RTN** and under **Text**. The color picker appears.
   b. Select a color and click **OK**.
4. Configure the "return to normal" record background color. Do the following:
   a. Click the color field next to **Alarm RTN** and under **Background**. The color picker appears.
   b. Select a color and click **OK**.
5. Click **OK**.

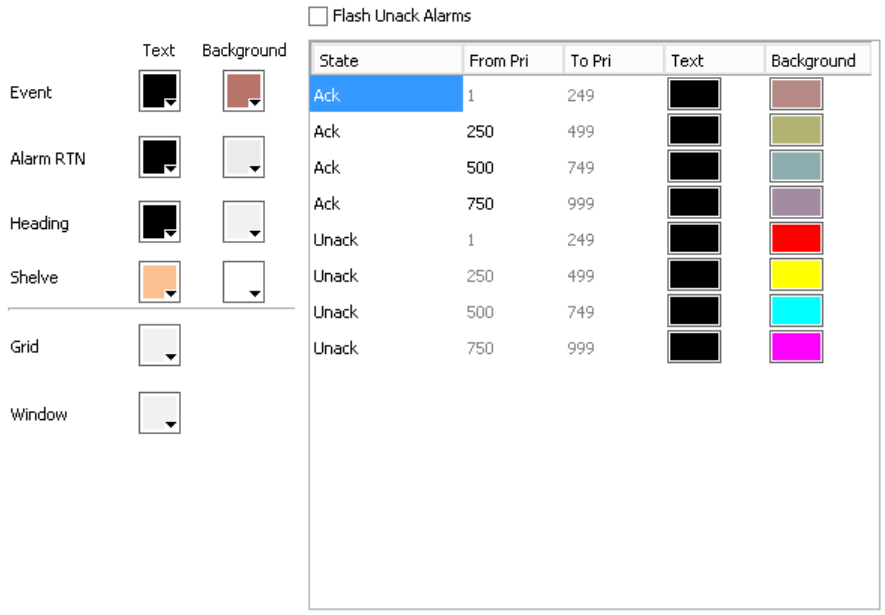
### Set Heading, Grid, and Window Color

You can set text color and background color for the heading, the grid color, and the Alarm Control window color. Use the corresponding HeadingColor.ForeGround Property, HeadingColor.BackGround Property, GridColor Property, and WindowColor Property properties in scripting to set the colors for heading, grid, and window.

#### To set heading, grid, and window color for the Alarm Control

1. Double-click the Alarm Control on the canvas. The **Edit Animations** dialog box appears.
2. Click **Colors**. The **Colors** page appears.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




3. Do one of the following:
   a. Configure the heading text color by clicking the color box next to **Heading** and under **Text**. If the color box does not open, you need to select the **Show Heading** option on the **Run-Time Behavior** page first.
   b. Configure the heading background color by clicking the color box next to **Heading** and under **Background.** If the color box does not open, you need to select the **Show Heading** option on the **Run-Time Behavior** page first.
   c. Configure the grid color by clicking the color box next to **Grid**. If the color box does not open, you need to select the **Show Grid** option on the **Run-Time Behavior** page first.
   d. Configure the window color by clicking the color box next to **Window.**

## Set Alarm Shelving Colors

You can set text color and background color for alarms that are temporarily shelved.

### To set alarm shelved colors

1. Double-click the Alarm Control on the canvas. The **Edit Animations** dialog box appears.
2. Click **Colors**. The **Colors** page appears.
3. Configure the shelve record text color. Do the following:
   a. Click the color field next to **Shelve** and under **Text**. The color picker appears.
   b. Select a color and click **OK**.
4. Configure the shelve record background color. Do the following:
   a. Click the color field next to **Shelve** and under **Background**. The color picker appears.
   b. Select a color and click **OK**.
5. Click **OK**.

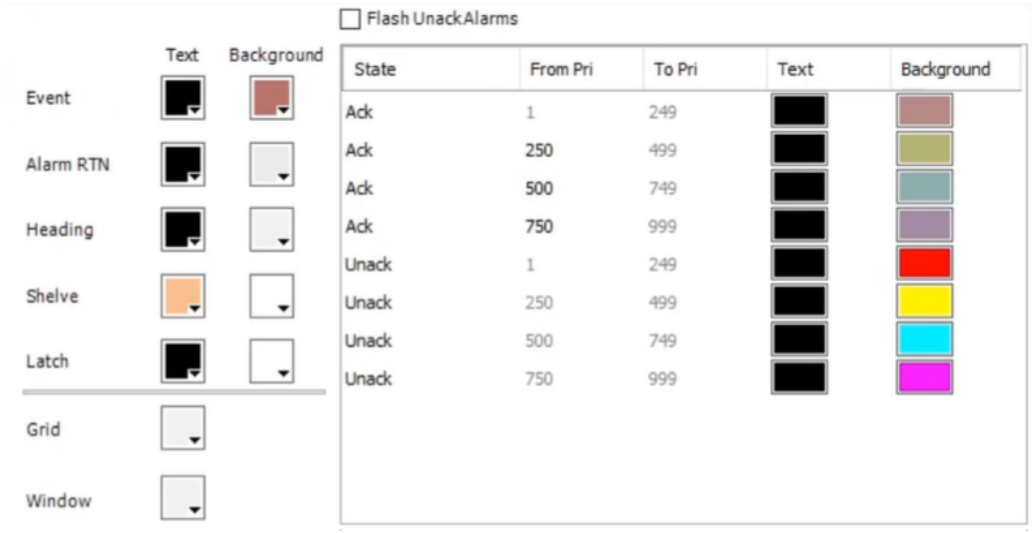
## Set LATCHED State Record Colors

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

You can set text color and background color for the LATCHED alarm records. Use the LatchColor.ForeGround Property and LatchColor.BackGround Property properties in scripting to set the LATCHED state alarm record text color and background color at run time.

### To set text and background colors for LATCHED alarm records

1. Double-click the **Alarm Control** on the canvas. The **Edit Animations** dialog box appears.
2. Click the **Colors**. The **Colors page** appears.




3. Configure the LATCHED state alarm record text color. Do the following:
   a. Click the color field next to **Latch** and under **Text**. The color picker appears.
   b. Select a color and click **OK**.
4. Configure the Latched State alarm record background color. Do the following:
   a. Click the color field next to **Latch** and under **Background**. The color picker appears.
   b. Select a color and click **OK**.
5. Click **OK**.

## Set Priority Ranges for Alarm Records

You can use alarm priority ranges to filter alarms. The Alarm Control can show alarms within a given range with a different text and background color. Use the AlarmColor.Range Property group in scripting to set the breakpoints at run time.

The Alarm Control supports four alarm ranges defined by three breakpoints:

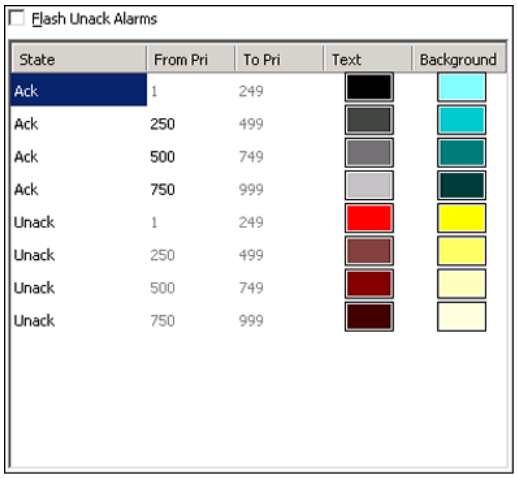
1 < breakpoint 1 < breakpoint 2 < breakpoint 3 < 999

### To set priority ranges for alarm records

1. Double-click the Alarm Control on the canvas. The Edit Animations dialog box appears.
2. Click **Colors**. The **Colors** page appears.
3. In the **From Pri** column in the list at the right, locate the break point you want to change. These are values except 1 or 999.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

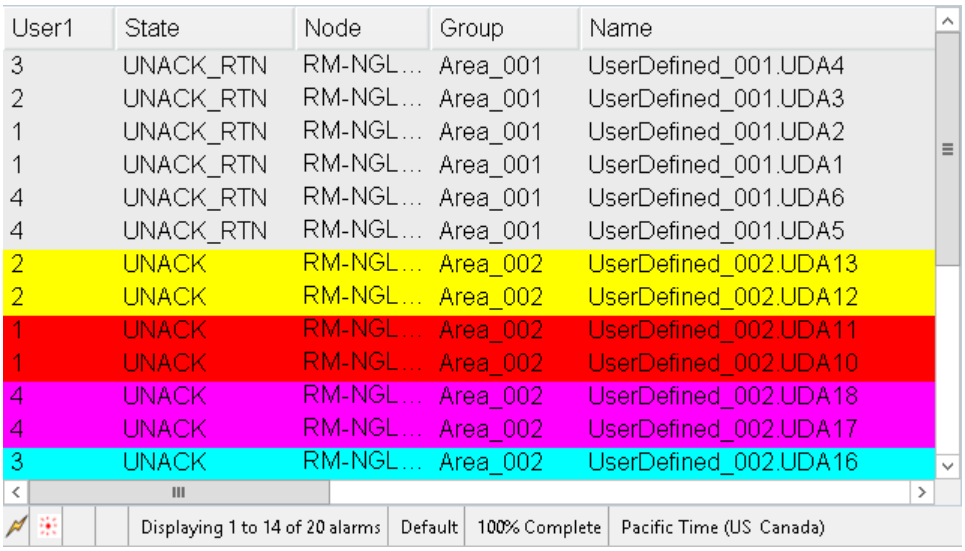
4. Click the value and type a new value in the range between the previous breakpoint and the next breakpoint.




5. Press **Enter**. All priority values in the list are updated.
6. Click **OK**.

### Example

If you use the color configuration in the procedure above, the Alarm Control at run time could have following appearance:




## Set Colors for Acknowledged Alarms

You can set the text and background colors for records of acknowledged alarms. For each of the priority ranges, you can set a text color and a background color. Use the AlarmColor.Ack.ForeGround Property and AlarmColor.Ack.BackGround Property property groups in scripting to set the text color and background color for acknowledged alarms in each priority range at run time.

### To set colors for acknowledged alarm records

1. Double-click the Alarm Control on the canvas. The **Edit Animations** dialog box appears.
2. Click **Colors**. The **Colors** page appears.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

3. In the list at the right, locate the **Ack** record and priority range for which you want to change the text or background color.
4. Click the color box in the **Text** or **Background** column of the line. The color picker appears.
5. Select a color and click **OK**.
6. Click **OK**.

### Set Colors for Unacknowledged Alarms

You can set the text and background colors for records of unacknowledged alarms. For each of the priority ranges, you can set a text color and a background color. Use the AlarmColor.UnAck.ForeGround Property and AlarmColor.UnAck.BackGround Property property groups in scripting to set the text color and background color for unacknowledged alarms in each priority range at run time.

#### To set colors for unacknowledged alarm records

1. Double-click the Alarm Control on the canvas. The **Edit Animations** dialog box appears.
2. Click **Colors**. The **Colors** page appears.
3. In the list at the right, locate the **Unack** record and priority range for which you want to change the text or background color.
4. Click the color box in the **Text** or **Background** column of the line. The color picker appears.
5. Select a color and click **OK**.

### Set Unacknowledged Alarms to Flash

Instead of showing unacknowledged alarm records in predefined constant text and background color, you can configure the Alarm Control to flash unacknowledged alarms in another text and background colors.

**Note:** The Flash Unack Alarms setting is checked by default for instances of the Alarm Control that are embedded in Situational Awareness Library symbols.

The unacknowledged alarm records flash between the colors of the Unack alarms and the colors of the Flash Unack alarms. Use the FlashUnAckAlarms Property Boolean property in scripting to set unacknowledged alarm records to flash at run time.

Use the AlarmColor.UnAck.Flash.ForeGround Property and AlarmColor.UnAck.Flash.BackGround Property property groups in scripting to set the text color and background color for flashing unacknowledged alarms in each priority range at run time.

#### To set flashing and colors for unacknowledged alarm records

1. Double-click the Alarm Control on the canvas. The **Edit Animations** dialog box appears.
2. Click **Colors**. The **Colors** page appears.
3. Select the **Flash Unack Alarms** check box.

   **Note:** You cannot select the **Flash UnAck Alarms** check box if the client mode is set to one of the historical modes.
4. In the list on the right, locate the **Unack** record and priority range for which you want to change the text or background color. Do the following:
   a. Click the color box in the **Text** or **Background** column of the line. The color picker appears.

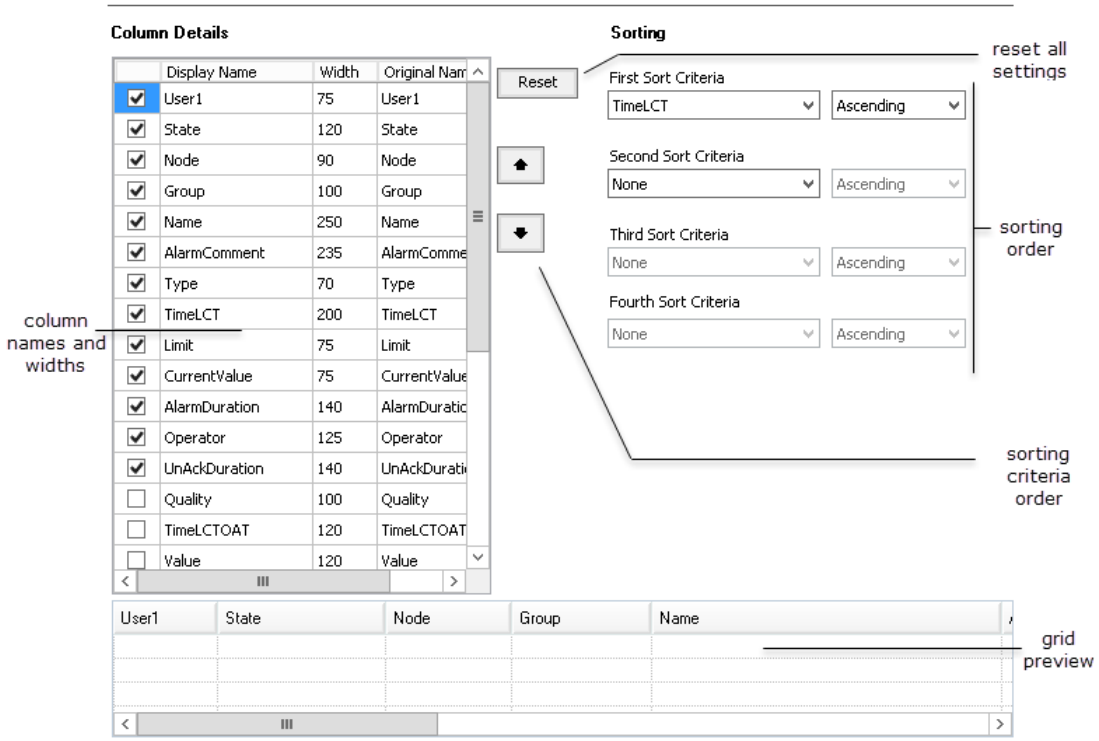
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

b. Select a color and click **OK**.

5. Locate the **Flash Unack** record and priority range for which you want to change the text or background color. Do the following:
   a. Click the color box in the **Text** or **Background** column of the line. The color picker appears.
   b. Select a color and click **OK**.
6. Click **OK**.

## Rename, Resize, and Reorder Column Headers

You can rename, resize, and change the order of column headers in the Alarm Control.




All changes you make in the Column Details list are shown in the grid preview.

You can also use the grid preview to resize columns or change their order with the pointer.

Column headers can be localized along with other symbol text when you export, translate, and reimport language files. The translated language files must be imported to the InTouch HMI for run-time language switching. For further information, see *Working with Languages* in the *Application Server User's Guide*.

**Important:** If you rename or reorder column headers, you must repeat the symbol text translation procedures. If you do not, your changes will not be available for run-time language switching.

### Rename Column Headers

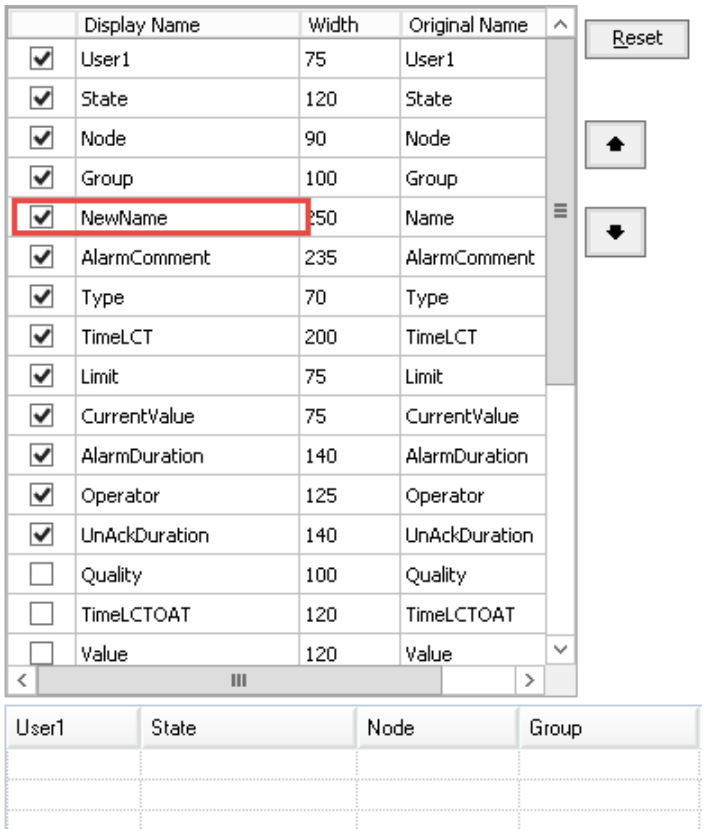
You can rename the column headers in the Alarm Control.

#### To rename column headers

1. Double-click the Alarm Control on the canvas. The **Edit Animations** dialog box appears.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

2. Click **Column Details** tab. The **Column Details** page appears.
3. In the **Column Details** list, locate the column header you want to rename and click on it.
4. Type a new name and press **Enter**. The **Column Details** list and the grid preview are updated with the new name.




5. Click **OK**.

## Resize Columns

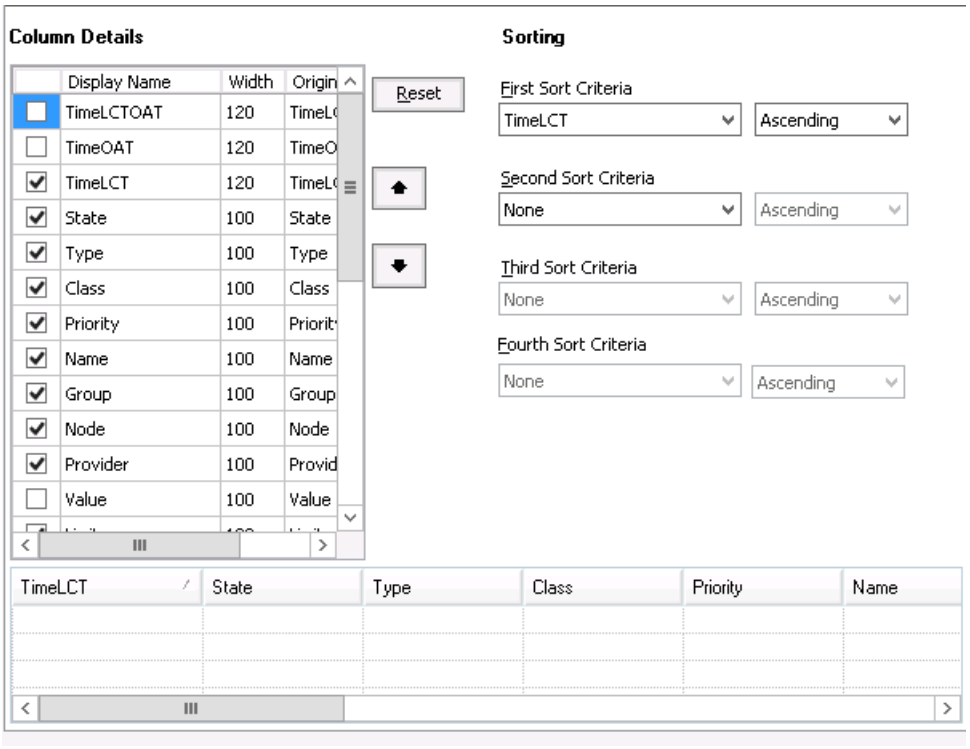
You can resize the column headers in the Alarm Control either by:

- Typing in a numeric value
- Dragging the column header boundary width with the pointer in the grid preview

### To resize the column numerically

1. Double-click the Alarm Control on the canvas. The **Edit Animations** dialog box appears.
2. Click **Column Details**. The **Column Details** page appears.
3. In the **Column Details** list, locate the name of the column you want to resize and click on the **Width** value in the row.
4. Type a new width in pixels and press **Enter**. The **Column Details** list and the grid preview are updated.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




5. Click **OK**.

### To resize the column graphically

1. Double-click the Alarm Control on the canvas. The **Edit Animations** dialog box appears.
2. Click **Column Details**. The **Column Details** page appears.
3. In the grid preview, locate the column you want to resize and drag the column boundary to resize the column. The width value of the **Column Details** list is updated.
4. Click **OK**.

## Change the Order of Columns

You can change the order of the columns in the Alarm Control by:

- Moving column names up and down in the **Column Details** list using buttons
- Dragging the column header with the pointer in the grid preview

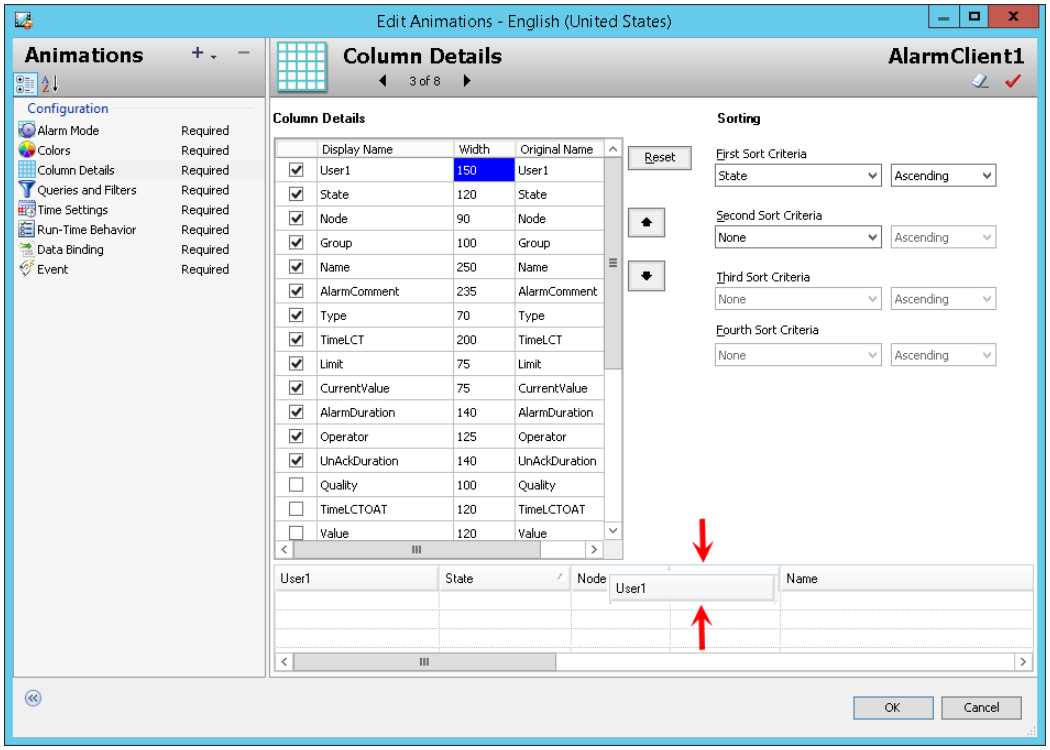
You also can reset the column widths and order to their default values. Resetting the column widths and order also resets the names to their default values.

### To change the column order

1. Double-click the Alarm Control on the canvas. The **Edit Animations** dialog box appears.
2. Click **Column Details**. The **Column Details** page appears.
3. Do one of the following:
    - Click arrow up and arrow down to reposition the columns

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- In the grid preview, drag the name of the column you want to reposition and drop it to the left of another column to reposition it




The grid preview and the **Column Details** list shows the new column order.

4. Click **OK**.

### To reset column widths and order

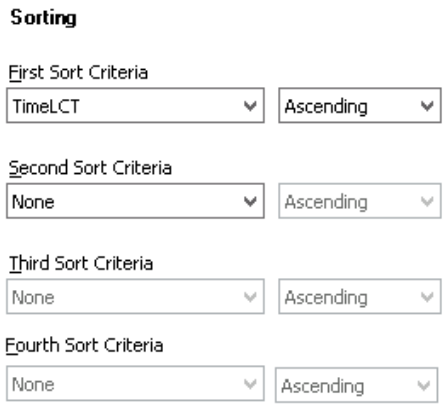
1. Double-click the Alarm Control on the canvas. The **Edit Animations** dialog box appears.
2. Click **Column Details**. The **Column Details** page appears.
3. Click **Reset**. The column widths, names, and order are reset to their default values.
4. Click **OK**.

## Sort Alarms

You can configure how the Alarm Control sorts alarm records at run time. By default, the Alarm Control lists alarm records by time in ascending order.

You can sort alarm records in ascending or descending order based on a first sort criteria, an optional second sort criteria, an optional third sort criteria, and and optional fourth sort criteria.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

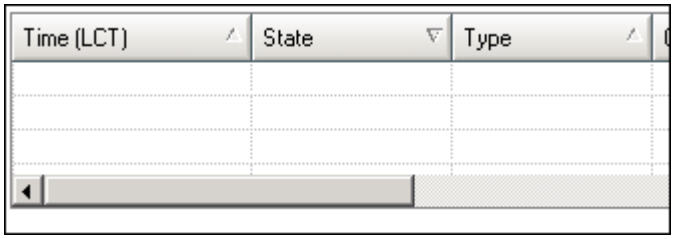



You can configure the sorting columns and directions either in lists or with the grid preview. Use the SortColumn.First Property, SortColumn.Second Property, and SortColumn.Third Property properties in scripting to set the columns to be sorted at run time. Use the SortOrder.First Property, SortOrder.Second Property, and SortOrder.Third Property properties in scripting to set the sort direction for each at run time.

### To set sorting columns and directions with lists

1. Double-click the Alarm Control on the canvas. The **Edit Animations** dialog box appears.
2. Click **Column Details**. The **Column Details** page appears.
3. In the **Sorting** area, do the following:
   a. Select the primary sort column in the **First Sort Column** list and a sorting direction in the list to its right.
   b. Optionally, select the secondary sort column in the **Second Sort Column** list and a sorting direction in the list to its right.
   c. If you set the **Second Sort Column**, optionally select the tertiary sort column in the **Third Sort Column** list and a sorting direction in the list to its right.

   The grid preview is updated and shows arrows for the sorted columns and their sort directions.




### To set sorting columns and directions with the grid preview

1. Double-click the Alarm Control on the canvas. The **Edit Animations** dialog box appears.
2. Click **Column Details**. The **Column Details** page appears.
3. In the grid preview, click on a column to select it for sorting. An arrow appears on the column header and the change is also shown in the **Sorting** area lists.
4. To change the sorting direction, click on the column header again. The arrow changes on the column header and the change is also shown in the **Sorting** area lists.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

**Note:** If you click on a column header after releasing the **Shift** key, all sorting information is lost and the selected column is the new primary sorting criteria.

5. To set second, third, and fourth sorting, hold the **Shift** key and repeat from step 3.
6. Release the **Shift** key.
7. Click **OK**.

## Filter Alarms

You can filter current and historical alarms by using queries and filters. Queries and filters are collections of filter criteria in a logical construct.

For example, you can filter alarms by defining a query or a filter that only shows alarms with priorities larger than 500 and smaller than 750.

You can re-use the filters and queries you define for historical alarms for current alarms and vice versa. You can also re-use filters and queries you define at design time at run time and vice versa.

**Important**: Queries and filters for current alarms and recent alarms and events require at least a **Provider** and **Group** as filter criteria. These must use the equals sign or a message asking for those fields will appear.

When you use TimeLCT, TimeOAT, or TimeLCTOAT as filter criteria for historical alarm modes, you need make sure that the TimeSelector.StartDate and TimeSelector.EndDate properties do not limit the query. Otherwise the Alarm Control can possibly not return all alarm and event records.

Set the TimeSelector.StartDate property earlier than any time filtering requirement, and the TimeSelector.EndDate later than any time filtering requirement.

### Using Wildcards in Queries

In current alarm queries, you can use wildcards only in the Tagname part of the query and not in the Provider, Group, or Node part of the query. A valid example is:

```
\galaxy!Mixing!RotorBlade*
```

In query filters that are used for current queries, the same restrictions apply.

In query filters that are used for historical queries, you must convert the operator and wildcard to SQL syntax according to the following table:

| | Current Query | Historical Query |
|---|---|---|
| Operator | = | Like |
| Wildcard | * | % |

For example:

```
Provider = ‘galaxy’ AND Group = ‘Mixing’
AND Name Like ‘RotorBlade%’
```

If you want to use a query filter containing a wildcard for a current query and a historical query, create two separate query filters. If a column contains null data, it cannot be retrieved using the Like operator.

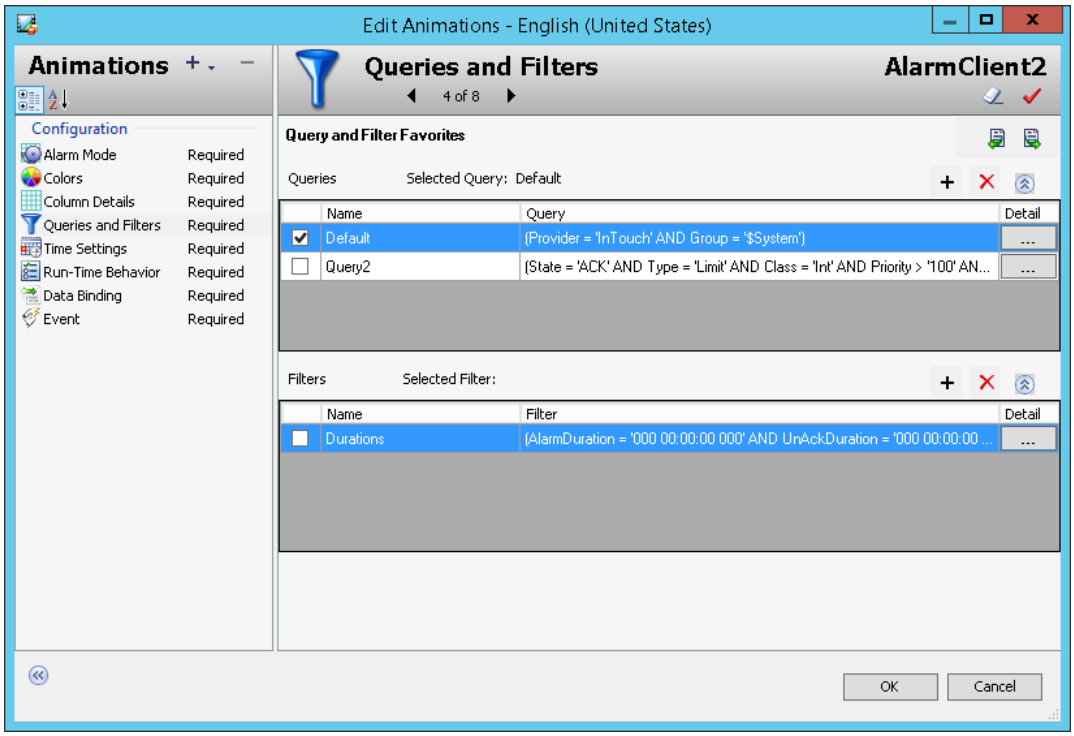
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

## Use an Existing Query or Filter

You can use an existing query filter to filter the alarms shown in the Alarm Client Control. You can also use the Favorite Property string property in scripting to switch to an existing query filter at run-time.

### To use an existing query filter

1. Double-click the Alarm Control on the canvas. The **Edit Animations** dialog box appears.
2. Click **Queries and Filters**. The **Query and Filter Favorites** page appears.
3. In the **Query and Filter Favorites** list, select a query or filter by clicking the check box before each query or filter name.




4. Click **OK**.

**Note:** In Current Alarms mode, if you try to proceed from **Queries and Filters** page with no query or filter selected, you will be prompted with a message to confirm you want to continue. Upon click of Yes the default query will be selected and you can continue. Upon click of No, you will be returned to the Queries and Filters page. If a query is selected but no filter, no message will display.

In Historical Alarms mode, if you proceed without a query selected but have selected a filter, the filter will be applied. If neither query nor filter is selected, you will be prompted with the same message.

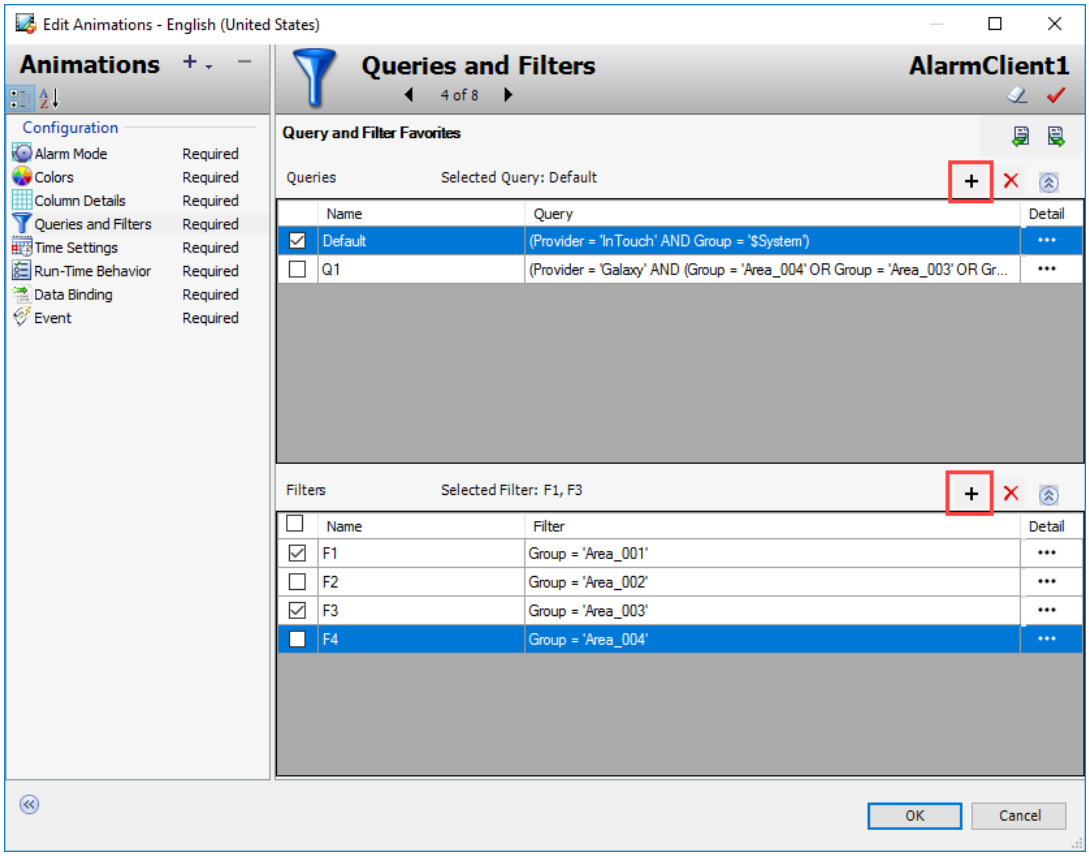
## Add a New Query or Filter

You can define a new query filter to filter the alarms shown in the Alarm Client Control. The new query filter is saved as a favorite in the **Query Filter Favorites** list.

### To add a new query filter

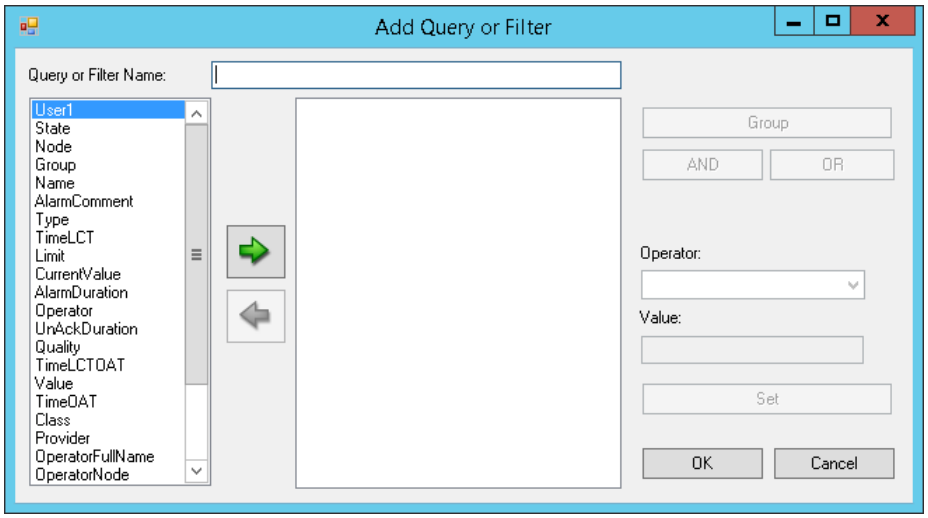
1. Double-click the Alarm Control on the canvas. The **Edit Animations** dialog box appears.
2. Click **Queries and Filters**. The **Query and Filter Favorites** page appears.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




3. Click the **Add New Query** button above the saved query favorites box or click the **Add New Filter** button above the saved filter favorites box.

   The **Add Query or Filter** dialog box appears.




4. Construct queries or filters as needed.

   For more information, see Construct Filters

5. You can configure and select more than one filter for any selected query. For example, “F1” and “F3”.

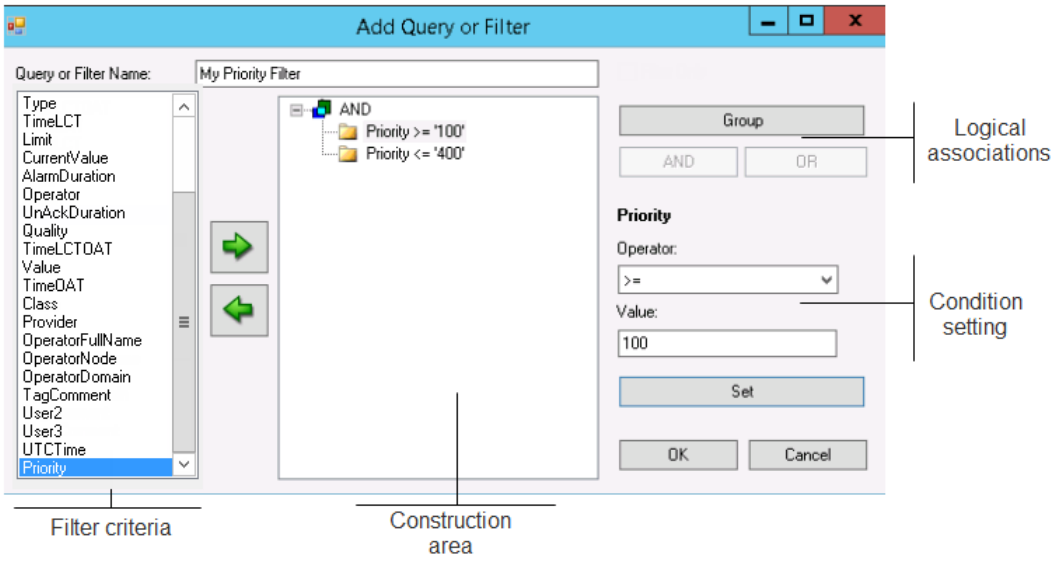
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

The “Selected Filter” label will display the selected filters using comma separator.

6. To select all filters, click the **Select All** checkbox. If the Select All checkbox is unchecked, all filters will be unselected.

## Construct Filters

You use the **Add Query or Filter** dialog box to create or edit a filter graphically.




### To construct a filter

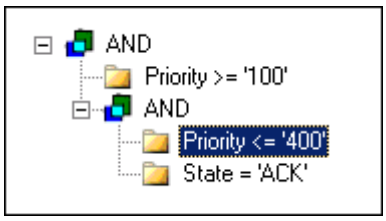
1. If you want to change the filter name, type a new unique name in the **Filter Name** box.
2. Add filter criteria to the construction area by selecting a column name on the left and clicking the right arrow button. When you add filter criteria to the construction area, they are automatically logically connected by AND.




3. If necessary, remove filter criteria by selecting them in the filter construction area and clicking the left arrow button.
4. To change the logical operator, select it in the filter construction area, and then either:
   - Click **AND** or **OR**
   - Right-click and select **AND** or **OR** from the shortcut menu
5. To group filter criteria logically, either:
   - Drag a filter criteria in the construction area over another filter criteria
   - Select one filter criteria, click **Group**, and then click the other filter criteria

   By default, the filter criteria are logically grouped with AND. If necessary, you can select the **AND** item in the tree and click **OR** to change it to an OR grouping.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




6. Assign values to filter criteria.

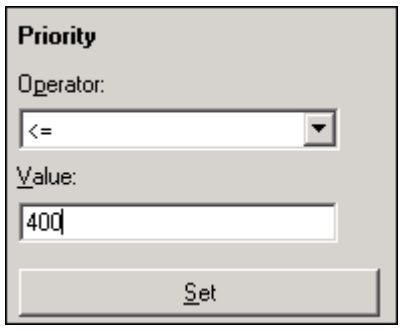
   **Note:** If you are using the Value column as a filter criteria, you may get unexpected results at run time. The items in the Value column are sorted alphabetically, not numerically. This is because the Value column can contain strings.

   Do the following:

   a. Select a filter criteria in the construction area.

   b. Select an operator from the **Operator** list.

   c. Type or select a value in the **Value** box.




   d. Click **Set**. The filter criteria is updated in the construction area.

7. To cut, copy, or paste individual filter criteria or filter criteria branches, right-click on the filter criteria and select the appropriate option from the shortcut menu.

8. When you are done, click **OK**.

## Modify an Existing Query or Filter

You can modify an existing query or filter using the **Modify Query or Filter** dialog box.

### To modify an existing query or filter

1. Double-click the Alarm Control on the canvas. The **Edit Animations** dialog box appears.
2. Click **Queries and Filters**. The **Queries and Filters** page appears.
3. Select an existing query or filter in the **Query and Filter Favorites** list by clicking on the check box before each query or filter name.
4. Click the ellipsis button. The **Modify Query or Filter** dialog box appears. For more information, see Construct Filters.
5. Click **OK**.

## Delete a Query or Filter Favorite

You can delete any non-default query or filter favorite.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### To delete a query or filter favorite

1. Double-click the Alarm Control on the canvas. The **Edit Animations** dialog box appears.
2. Click **Queries and Filters**. The **Queries and Filters** page appears.
3. Select an existing query or filter in the **Queries and Filter Favorites** list by clicking on the check box before each query or filter name.
4. Click the **Delete selected query** button or click the **Delete selected filter** button.
5. When a message appears, click **Yes**.

### Export Query and Filter Favorites

You can export the query and filter favorites lists to an XML file. The XML file containing the query and filter favorites can be imported to other Alarm Control in design time or run time. Do not edit this file directly. The default query is also exported to the XML file.

### To export the query and filter favorites lists

1. Double-click the Alarm Control on the canvas. The **Edit Animations** dialog box appears.
2. Click **Queries and Filters**. The **Queries and Filters** page appears.
3. Select an existing query or filter in the **Query and Filter Favorites** list by selecting the check box before each query or filter name.
4. Click the **Export** button. Select a location and a name for the XML file and click **Save**.

### Import Query and Filter Favorites

You can import the query filter favorites list from an XML file.

### To import the query filter favorites list

1. Double-click the Alarm Control on the canvas. The **Edit Animations** dialog box appears.
2. Click **Queries and Filters**. The **Queries and Filters** page appears.
3. Click **Import**. Navigate to the XML file you want to import.
4. In the **Import Option** list, click either:
   - **Append** to append the imported query filters to the existing query filters. If query filter names in the imported XML conflict with existing query filters, you are prompted to confirm the import for each filter
   - **Overwrite** to replace all existing query filters with the imported query filters
5. Select the XML file and click **Open**.

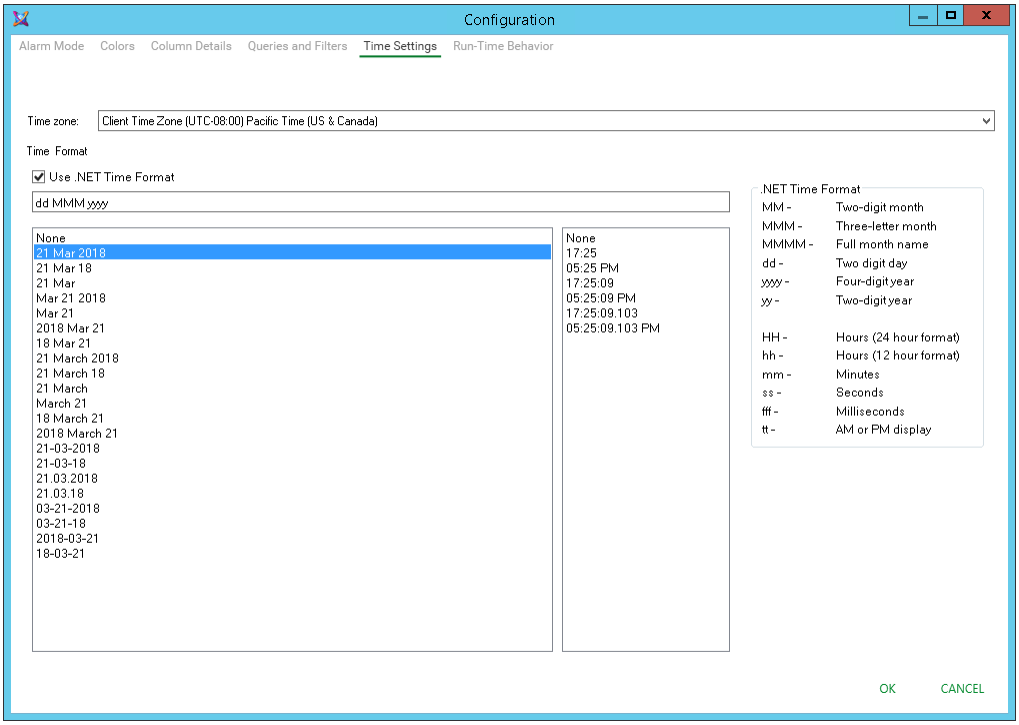
## Setting Time Zone and Format

You can set the time zone in which the client shows the alarm and event records. By default, the time zone is set to the client computer's current time zone at design time. Use the TimeZone.TimeZone Property, Time.Type Property, and Time.Format Property properties in scripting to set the time zone, time type, and time format at run time.

You can also set the time format of the alarm and event records. You can select between two different time format sets:

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- Default Time Format: same as the InTouch Alarm Viewer control and InTouch Alarm DB View control of InTouch version 10.0 and later
- .NET Time Format: defined by Microsoft .NET Framework time format conventions




## Set the Time Zone

You can set the time zone in which the Alarm Control shows the alarm and event records.

You can either set the time display to a predefined time zone, or to the client time zone. The client time zone is the time zone of the computer on which the Alarm Control is running.

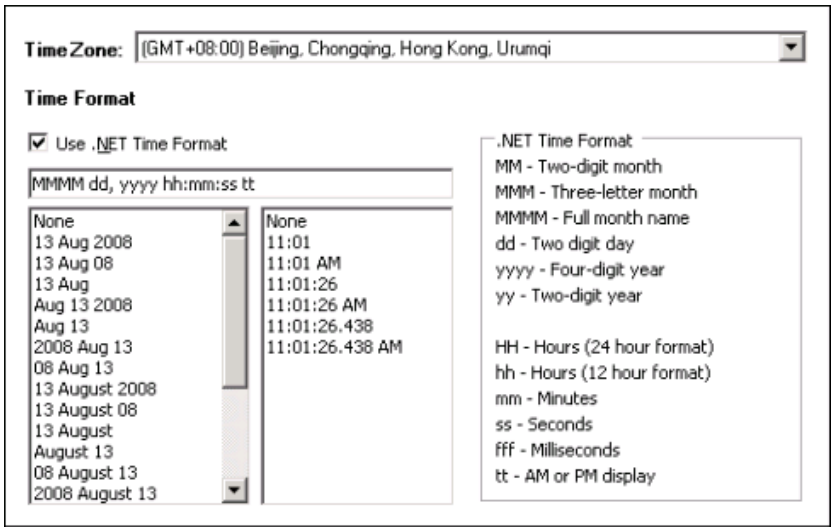
The **Client Time Zone** setting is useful if you are deploying an application using the Alarm Control to a different time zone.

For example, if you develop your application in the Pacific Time zone and deploy it to two computers in the time zones Central Time and Eastern Time, you can ensure the Alarm Control shows the local time for each deployment by setting the time zone to **Client Time Zone**.

### To set the time zone

1. Double-click the Alarm Control on the canvas. The **Edit Animations** dialog box appears.
2. Click **Time Settings**. The **Time Settings** page appears.
3. In the **Time Zone** list, select a time zone.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




4. Click **OK**.

## Set a Time Format

You can set the time format in which the Alarm Control shows the alarm and event records. You can either use a predefined datetime format, or compose one.

### To set the time format

1. Double-click the Alarm Control on the canvas. The **Edit Animations** dialog box appears.
2. Select **Time Settings**.
3. In the **Time Format** area, do the following:
   a. Make sure **Use .NET Time Format** is cleared.
   b. Select date format codes from the list at the right. The equivalent date format code appears in the box above.
   c. Select time format codes from the list at the right. The equivalent time format code is appended to the date format string.
4. If you want to customize the datetime format, modify the codes in the box as follows:

| Code | Purpose | Example |
|---|---|---|
| %m | Two-digit month | 03 |
| %b | Three-letter month | Mar |
| %B | Full month name | March |
| %d | Two-digit day | 17 |
| %Y | Four-digit year | 2008 |
| %y | Two-digit year | 08 |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Code | Purpose | Example |
|---|---|---|
| %#x | Full day and date | Tuesday, March 11, 2008 |
| %H | Hours in 24 hour format | 14 |
| %I | Hours in 12 hour format | 2 |
| %M | Minutes | 55 |
| %S | Seconds | 34 |
| %s | Milliseconds | 223 |
| %p | AM or PM | PM |

5. Click **OK**.

### Set a .NET DateTime Format

You can set the .NET DateTime format in which the Alarm Control shows the alarm and event records. You can either use a predefined DateTime format, or compose one. The predefined date format is based on the short date format setting of the operating system and may vary from computer to computer.

#### To set the .NET DateTime format

1. Double-click the Alarm Control on the canvas. The **Edit Animations** dialog box appears.
2. Click **Time Settings**. The **Time Settings** page appears.
3. In the **Time Format** area, do the following:
   a. Select the **Use .NET Time Format** check box.
   b. Select date format codes from the list at the right. The equivalent date format code appears in the box above.
   c. Select time format codes from the list at the right. The equivalent time format code is appended to the time format string.
4. If you want to customize the DateTime format, modify the codes in the box as in the table below. For more information, see the Microsoft Knowledge database on .NET DateTime formats.

| Code | Purpose | Example |
|---|---|---|
| M | Single-digit month | 9 |
| MM | Two-digit month | 09 |
| MMM | Three-letter month | Sep |
| MMMM | Full month name | September |
| d | Single-digit day | 8 |
| dd | Two-digit day | 08 |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Code | Purpose | Example |
|---|---|---|
| ddd | Abbreviated day of the week | Mon. |
| dddd | Day of the week | Monday |
| yyyy | Four-digit year | 2008 |
| yy | Two-digit year | 08 |
| HH | Hours in 24 hour format | 14 |
| hh | Hours in 12 hour format | 2 |
| mm | Minutes | 55 |
| ss | Seconds | 34 |
| fff | Milliseconds | 223 |
| tt | AM or PM | PM |

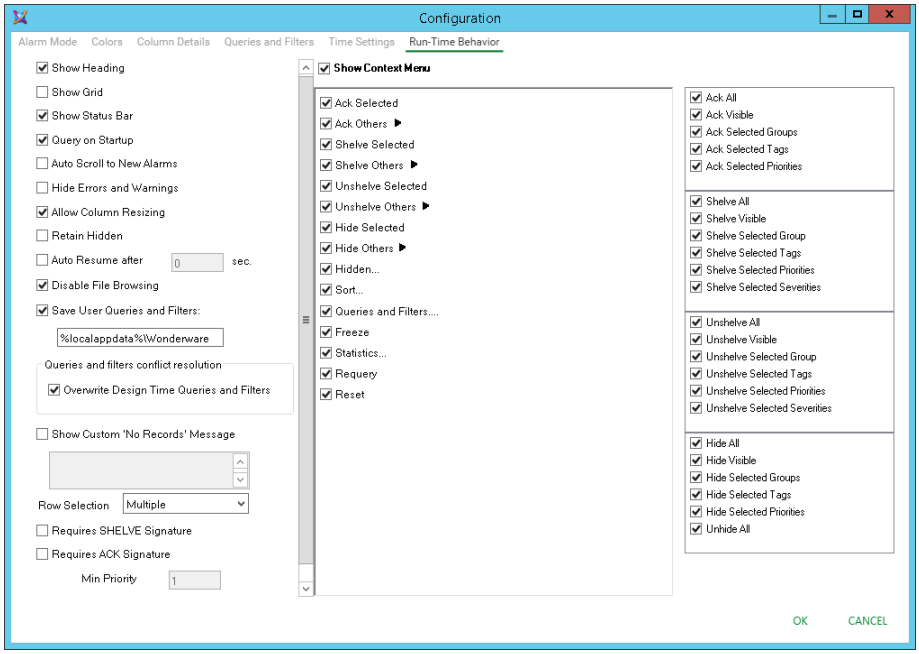
5. Click **OK**.

## Configuring Run-Time Behavior

You can configure the behavior and appearance of the Alarm Control at run time, for example:

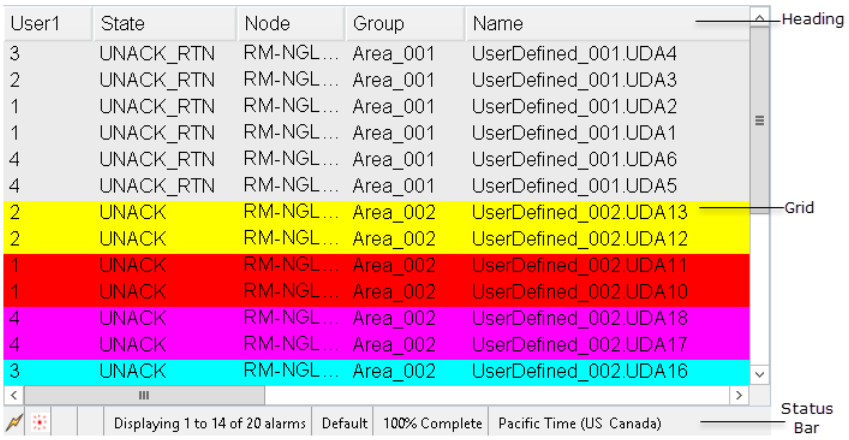
- Showing and Hiding parts of the Alarm Control
- Specifying if the Alarm Control queries the alarm database when it starts up
- Scrolling to new alarms
- Hiding warnings, errors, and messages
- Restricting operator access to parts of the Alarm Control
- Specifying Alarm Control freeze behavior
- Customizing the "no records" message
- Configuring alarms to require an ACK signature
- Configuring alarms to require a SHELVE signature
- Customizing the run-time shortcut menu

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




## Show Heading, Grid, or Status Bar

You can show and hide parts of the Alarm Control at run time, such as the heading, grid, or status bar. Use the ShowHeading Property, ShowGrid Property, and ShowStatusBar Property properties in scripts to show or hide the heading, grid, and status bar at run time.




### To show the heading, grid, or status bar at run time

1. Double-click the Alarm Control on the canvas. The **Edit Animations** dialog box appears.
2. Click **Run-Time Behavior**. The **Run-Time Behavior** page appears.
3. To show or hide parts of the Alarm Control during run time, do any of the following:
   - Select the **Show Heading** check box to show the heading at run time, or clear it to hide the heading at run time.
   - Select the **Show Grid** check box to show the grid at run time, or clear it to hide the grid at run time.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- Select the **Show Status Bar** check box to show the status bar at run time, or clear it to hide the status bar at run time.

  **Caution**: If you hide the status bar, you will not be able to see important indicators, such as the New Alarms, Hidden Alarms, and Frozen Grid indicators.

4. Click **OK**.

### Automatic Query for Alarms on Start Up

You can configure the Alarm Control to automatically query the Alarm Database when the control starts up at run time. Use the QueryStartup Property in scripts to control query behavior when the Alarm Control starts.

By default, current alarms and recent alarms and events are automatically queried when the Alarm Control starts at run time. You can disable the automatic query if the Alarm Control is:

- Configured to mainly use query filters
- Controlled mainly by scripts

#### To query the Alarm Database automatically on start up

1. Double-click the Alarm Control on the canvas. The **Edit Animations** dialog box appears.
2. Click **Run-Time Behavior**. The **Run-Time Behavior** page appears.
3. Select the **Query on Startup** check box.
4. Click **OK**.

### Scroll Automatically to New Alarms

If an operator views multiple pages of alarms, new alarms may go unnoticed. You can configure the Alarm Control to scroll automatically to show new alarms. Use the AutoScroll Boolean property in scripts to scroll automatically to new alarms.

However, if the Alarm Control scrolls automatically to new alarms, it may be hard for the operator to view and analyze older alarms if new alarms occur. If the Alarm Control is frozen, it will not scroll automatically to new alarms.

#### To scroll automatically to new alarms

1. Double-click the Alarm Control on the canvas. The **Edit Animations** dialog box appears.
2. Click **Run-Time Behavior**. The **Run-Time Behavior** page appears.
3. Select the **Auto Scroll to New Alarms** check box.
4. Click **OK**.

### Hide Errors, Warnings, and Status Messages

You can prevent a message dialog box from opening when errors, warnings, or status messages occur in the Alarm Control. Even if you hide errors, warnings and status messages are sent to the Logger. Use the HideErrors property in scripts to hide error, warning, and status messages at run time.

#### To hide error and warning messages

1. Double-click the Alarm Control on the canvas. The **Edit Animations** dialog box appears.
2. Click **Run-Time Behavior**. The **Run-Time Behavior** page appears.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

3. Select the **Hide Errors and Warnings** check box.
4. Click **OK**.

### Restrict User Access to Rows and Columns

You can prevent the operator from:

- Resizing columns
- Selecting rows
- Selecting multiple rows

Use this feature for interfaces where it is easy to accidentally resize columns or select rows. For example, if the Alarm Control is running on a small display, use the AllowColumnResize Property and RowSelection Property properties in scripting to control the ability to resize columns and select rows at run time.

#### To prevent the operator from resizing columns

1. Double-click the Alarm Control on the canvas. The **Edit Animations** dialog box appears.
2. Click **Run-Time Behavior**. The **Run-Time Behavior** page appears.
3. Clear the **Allow Column Resizing** check box.
4. Click **OK**.

#### To prevent the operator from selecting rows

1. Double-click the Alarm Control on the canvas. The **Edit Animations** dialog box appears.
2. Click **Run-Time Behavior**. The **Run-Time Behavior** page appears.
3. In the **Row Selection** list, click:
   - **No** to prevent operator from selecting rows
   - **Single** to allow operator to only select one row
   - **Multiple** to allow operator select multiple rows
4. Click **OK**.

### Retain Hiding when Changing Alarm Query Filter

You can configure the Alarm Control to hide alarms even if the alarm query filter changes. Use the RetainHidden Property in scripts to retain the hiding of alarms at run time.

#### To retain hiding when change the alarm query filter

1. Double-click the Alarm Control on the canvas. The **Edit Animations** dialog box appears.
2. Click **Run-Time Behavior**. The **Run-Time Behavior** page appears.
3. Select the **Retain Hidden** check box.
4. Click **OK**.

### Override the Frozen Grid

You can configure the Alarm Control to unfreeze the grid after a given time in seconds. Use this option to make sure that new alarms appear on the grid after a specified time. Use the AutoResumeDuration Property in scripts to unfreeze the Alarm Control after a certain duration at run time.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

The Alarm Control also unfreezes if you change one of the following:

- Alarm Mode
- Alarm Query
- Query Filter

### To override the frozen grid

1. Double-click the Alarm Control on the canvas. The **Edit Animations** dialog box appears.
2. Click **Run-Time Behavior**. The **Run-Time Behavior** page appears.
3. Select the **Auto Resume after** check box and type the number of seconds after which the grid unfreezes.
4. Click **OK**.

## Customize the "No Records" Message

You can customize the message that appears when there are no records to show in the grid. Use the NoRecordsMessage.Enabled Property and NoRecordsMessage.Message Property in scriptw to customize the "no records" message at run time.

### To customize the "no records" message

1. Double-click the Alarm Control on the canvas. The **Edit Animations** dialog box appears.
2. Click **Run-Time Behavior**. The **Run-Time Behavior** page appears.
3. Select the **Show Custom 'No Records' Message** check box and type a message you want to show in the Alarm Control when there are no alarm records.
4. Click **OK**.

## Changing the Language of the "No Records" Message

You can change the language of the message that appears when there are no records to show in the Alarm Control grid.

### To change the language of the "No Records" Message

1. Right-click on the canvas and click **Scripts**. The **Edit Scripts** dialog box appears.
2. Click the Add icon and give the script a name, for example ChangeLanguage.
3. In the **Expression** box, type:
```
intouch:$Language
```
4. In the **Trigger** list, click **DataChange**.
5. In the script area, type the following:
```
If intouch:$Language == 1033 then ' Switch to English
AlarmClient1.NoRecordsMessage.Message = "No Records";
   else If intouch:$Language == 1031 then ' Switch to German
   AlarmClient1.NoRecordsMessage.Message = "Keine Einträge";
      else if intouch:$Language == 1036 then ' Switch to French
      AlarmClient1.NoRecordsMessage.Message = "Aucun enregistrement";
      endif;
   endif;
endif;
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

6. Click **OK**.

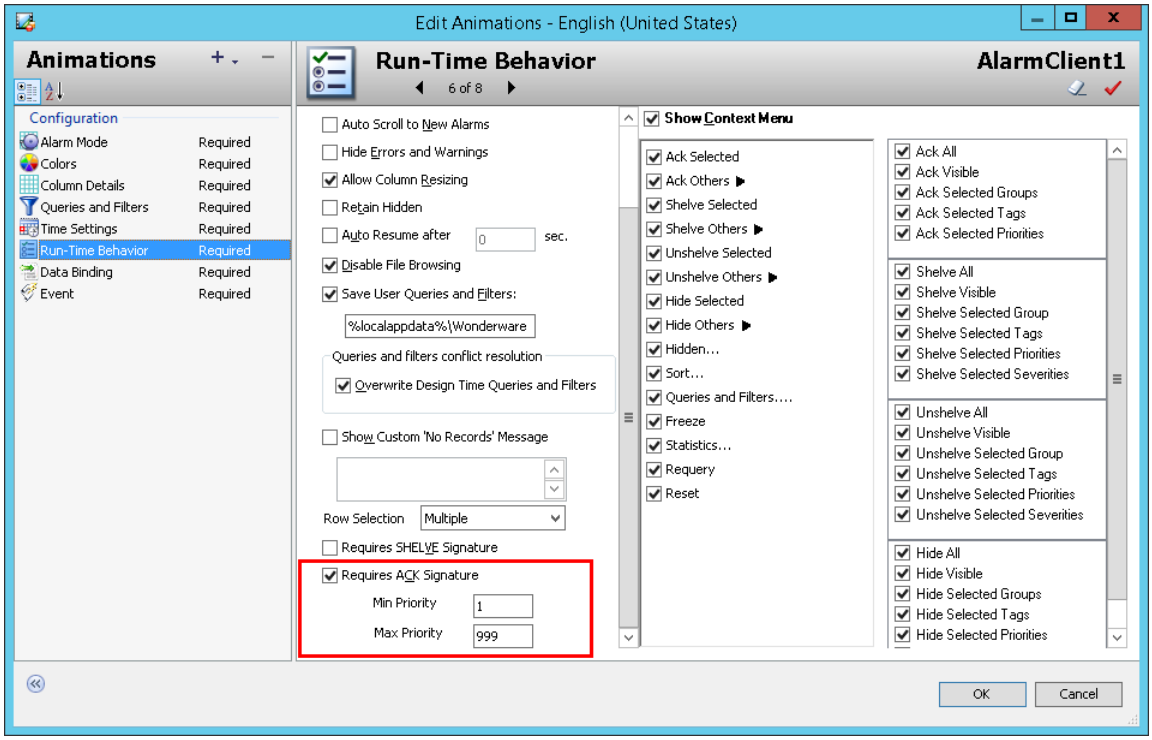
## Configure the Alarm Control to Require an ACK Signature

Even if you are logged into the InTouch application, acknowledging the alarms that fall within a specific priority range may need to be authenticated by you if required by your company or industry. You can configure the Alarm Control to provide such functionality by selecting the **Requires ACK Signature** check box in the **Object Properties** dialog of the Alarm Control.

After the Alarm Control has been configured to require a signature for acknowledgement, you need to set its minimum and maximum priority values. The valid range of the minimum and maximum priority values is 1 to 999.

### To configure the Alarm Control to require ACK signature

1. Place an Alarm Control in the drawing canvas.
2. Double-click the Alarm Control on the canvas. The **Edit Animations** dialog box appears.




3. Click **Run-Time Behavior**. The **Run-Time Behavior** page appears.
4. Select the **Requires ACK Signature** check box. The **Min Priority** and **Max Priority** boxes are enabled.
5. Enter the minimum and maximum priority values for the alarm range that will require authentication.
6. Click **OK**.

You can configure the alarm signature requirement as well as the minimum and maximum values in run time using the **Object Editor**. For more information about using the **Object Editor**, see the Application Server User's Guide, Working with Objects.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

For more information about configuring the Alarm Control in run time to require an alarm acknowledgement signature, see the "SignedAlarmAck() Applied Examples" topic in the Creating and Managing Industrial Graphics User's Guide.

**Note:** If your computer supports Smart Cards, you can use them for alarm authentication at run time. You need to have the Smart Card mapped to your user account in the domain. If the Smart Card is already in the reader and you enter the correct PIN, the system will allow you to acknowledge the alarms.

### Configuring the Alarm Control to Require a SHELVE Signature

Operators can temporarily shelve selected alarms from the list of an Alarm Control's active alarms. A shelved alarm is suppressed and removed from the list of active alarms. Typically, operators shelve lower severity nuisance alarms because they provide little diagnostic value and interfere with the operator's ability to manage a plant process.

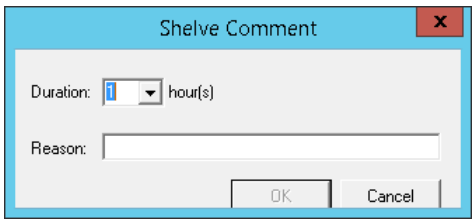
An alarm is shelved for a specified period. After the period ends, alarms are automatically unshelved and appear again in the list of active alarms. Operators can also manually unshelve an alarm before the end of the specified shelved period.

By default, Medium and Low severity alarms are enabled for shelving. Critical and High severity alarms are not because of the potential risk of shelving and ignoring alarms that represent serious operating states. For more information about enabling shelving based on alarm severity, see "Configuring Alarm Severity to Priority Mapping" in the *Application Server User Guide*.

The Alarm Control provides a configuration option to restrict alarm shelving only to operators authorized by application security. When an operator selects one or more alarms and attempts to shelve them, the Alarm Control verifies if a shelve signature is required.

- If no SHELVE signature is required

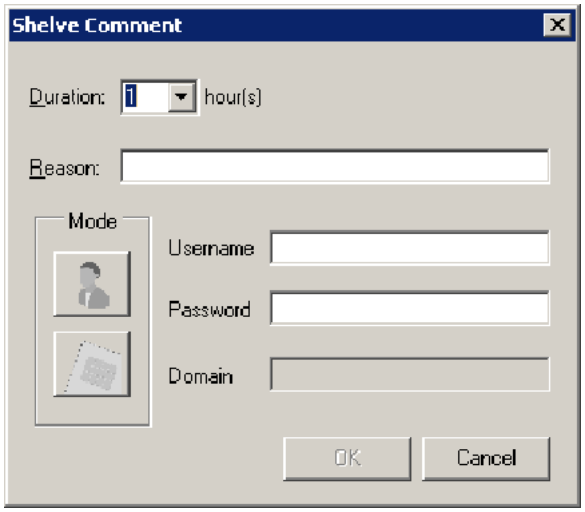
  The Alarm Control shows a simple **Shelve Comment** dialog box with a **Duration** field to select the number of hours (1, 2, 4, 8, 12) to shelve the alarm and a **Reason** field to enter a mandatory comment.




- If a SHELVE signature is required and application security is active

  The Alarm Control shows a **Shelve Comment** dialog box with fields for the operator to enter user credentials (name, password, domain) in addition to selecting a shelve duration and entering a mandatory comment.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




By default, the logged-in user appears in the **Username** field. If the application security type is **ArchestrA,** then ArchestrA appears in the **Domain** field and cannot be edited. If the credentials are valid, the Alarm Control attempts to shelve the selected alarms.

The Alarm Control shows an error message if the operator enters invalid credentials. When the operator clicks **OK** on the error message, the **Shelve Comment** dialog appears again with the entered user name, comment, and duration. The Password (or PIN) is blank. The operator can attempt to authenticate again or cancel.

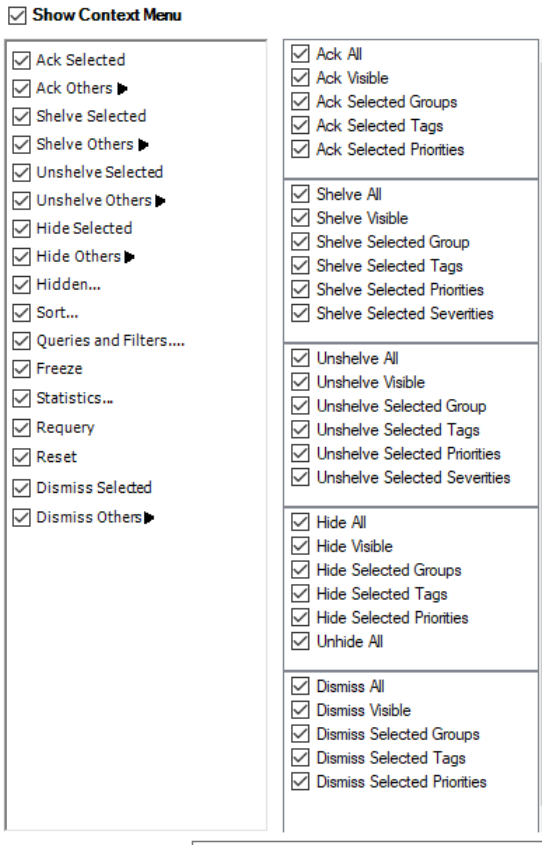
### To configure the Alarm Control to require a SHELVE signature

1. Place an Alarm Control in the drawing canvas.
2. Double-click the Alarm Control on the canvas. The **Edit Animations** dialog box appears.
3. Click **Run-Time Behavior**. The **Run-Time Behavior** page appears.
4. Select or clear **Requires SHELVE Signature** based on whether operators need to enter their credentials to shelve alarms or not.
5. Click **OK**.

## Configuring the Run-Time Shortcut Menu

You can configure the Alarm Control's shortcut menu to show only selected options at run time. The shortcut menus showing historical alarms (or events) and current alarms (or recent alarms and events) are different.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




For the current alarms Context menu, you can also show or hide entire shortcut submenus. Use the ContextMenu and the ShowContextMenu Property in scripting to control if shortcut menu items appear or not at run time.

### To hide the Context menu

1. Double-click the Alarm Control on the canvas. The **Edit Animations** dialog box appears.
2. Click **Run-Time Behavior**. The **Run-Time Behavior** page appears.
3. Clear the **Show Context Menu** check box.
4. Click **OK**.

### To show or hide Context menu options

1. Double-click the Alarm Control on the canvas. The **Edit Animations** dialog box appears.
2. Click **Run-Time Behavior**. The **Run-Time Behavior** page appears.
3. Make sure the **Show Context Menu** check box is selected.In the shortcut menu lists, do the following:
   a. Select the options you want to appear on the run-time Context menu (if applicable for the selected client mode).
   b. Clear the options you want to hide from the operator on the run-time Context menu.
4. Click **OK**.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Use the Alarm Control at Run Time

During run time, users can show a shortcut menu containing options to monitor and manage alarms. Also, other options enable users to sort and filter alarms shown by the Alarm control.

## Refresh the Alarm Control Grid

You can refresh the Alarm Control grid at run time. The Alarm Control retrieves alarm record data based on the Alarm Database time range settings.

**To refresh the alarm control**

1. Right-click the Alarm Control grid at run time. The shortcut menu appears.
2. Click **Requery**.

## View Status Bar Information

The status bar shows you information about the current Alarm Control grid. Depending on the client mode, the status bar information shows different information.

### Using Status Bar Information of Current Modes

If the Alarm Control is showing current alarms or recent alarms and events, the status bar shows the following:



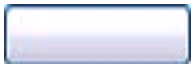

| Element | Icon(s) | Description |
|---|---|---|
| Client Mode | | Indicates the Alarm Control is showing current alarms (or recent alarms and events). |
| New Alarms | | Appears if new alarms have occurred. If you move the pointer over the indicator, the tooltip shows how many alarms are unacknowledged. |
| Hidden Alarms | | Appears if any alarms are currently hidden. If you move the pointer over the indicator, the tooltip shows how many alarms are hidden. |
| Frozen Grid | | Appears if the Alarm Control is currently frozen. |
| Alarm Records | | Displaying 1 to 13 of 28 alarms<br>Shows the total number of alarm records and which alarms are currently shown. |
| Query Filter | | Default<br>Shows the name of the current query filter favorite. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Element | Icon(s) | Description |
|---|---|---|
| Retrieval | | 100% Complete<br>Shows the percentage of alarms retrieved from all alarm providers.<br>If this percentage is less than 100%, not all alarm providers are providing alarm data. Use the **Alarm Statistics** dialog box to detect which alarm providers are not providing alarm data. |
| Time Zone | | Beijing, Chongqing, Hong Kong, Urumqi<br>Shows the current time zone of the Alarm Control. Move the pointer over the time zone to show the full information in a tool tip. |

### Using Status Bar Information of Historical Modes

If the Alarm Control shows historical alarms or events, the status bar shows the following fields:

| Element | Description |
|---|---|
| Client Mode |  <br>Indicates the Alarm Control is showing historical alarms and/or events. |
| Alarm Records | Displaying 1 to 13 of 28 alarms<br>Shows the total number of alarm records and the number of alarms shown by the Alarm Control. |
| Alarm Database | localhost - WWAlmDb<br>Shows the name of the server hosting the Alarm Database and the Alarm Database name. |
| Connection Status | Connected<br>Shows the connection status to the Alarm Database. |
| Time Zone | Beijing, Chongqing, Hong Kong, Urumqi<br>Shows the current time zone of the Alarm Control. Move the pointer over the time zone to show complete time zone information in a tool tip. |
| Requery |  <br>Click this button to retrieve latest alarm records from the Alarm Database. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

## Acknowledge Alarms

You can configure the Alarm Control to require an alarm to be acknowledged even if the condition causing the alarm has passed. This ensures that an operator is aware of events that caused a temporary alarm state, but have returned to normal. You acknowledge alarms at run time using a shortcut menu or by script methods.

You can acknowledge alarm records directly from the Alarm Control. You can acknowledge:

- One or more selected alarms
- All alarms, including alarms not visible due to the limited space of the Alarm Control
- All visible alarms
- All alarms with common values, such as provider names, group names, priority ranges, and tag names. You can simplify alarm acknowledgement for the operator by using methods in scripting. For more information, see the Ack.All() Method.

**Note:** When the Alarm Client Control is in the Recent Alarms and Events mode, the displayed alarms cannot be acknowledged.

### To acknowledge selected alarms using the Alarm Control grid

1. Select one or more alarms in alarm state.
2. Right-click on an alarm shown in the Alarm Control and click **Ack Selected**.

   If no default acknowledgement statement is configured for the Alarm Control, the **Ack Comment** dialog box appears.
3. Type an alarm acknowledgement comment and click **OK**.

### To acknowledge other alarms using the Alarm Control grid

1. Select one or more alarms in alarm state.
2. Right-click the Alarm Control grid, point to **Ack Others**, and click one of the following:
   - **Ack All** to acknowledge all alarms in alarm state
   - **Ack Visible** to acknowledge all visible alarms
   - **Ack Selected Group** to acknowledge alarms with the same provider names and group names of one or more selected alarms in alarm state.
   - **Ack Selected Tag** to acknowledge alarms with the same provider names, group names, and tag names within the priority ranges of one or more selected alarms in alarm state.
   - **Ack Selected Priority** to acknowledge alarms with the same provider names, group names, and within the priority ranges of one or more selected alarms in alarm state.
3. If no default acknowledgement statement is configured for the Alarm Control, the **Ack Comment** dialog box appears.
4. Type an alarm acknowledgement comment and click **OK**.

### Provide a Signature to Acknowledge Alarms

You must provide your signature in the **Ack Alarms** dialog box to acknowledge alarms. A signature is required when the **Require ACK Signature** check box is selected and any of the selected alarms falls within the configured priority range, or if no one is logged on to the InTouch application. You are not required to be logged on to the

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

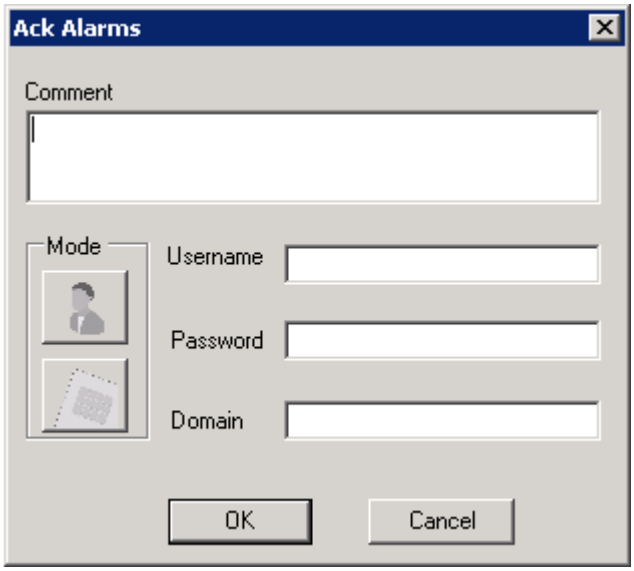
InTouch application to acknowledge alarms. However, if you are logged on, the **Username** box displays the username.

When you select the **Require ACK Signature** check box, the acknowledgment comment is prefixed in the updated Alarm Record. If one or more of the selected alarms falls within the configured priority range, the comment is prefixed with "Signed ACK -" indicating that it is a signed acknowledgment. Otherwise, it is prefixed with "Std ACK -" indicating that it is a standard acknowledgment.

**Note:** If the selected alarms do not require a signature, then the **Ack Alarms** dialog box displays the Comment box. You can enter a comment before acknowledging the alarm.

### To provide a signature to acknowledge alarms with user name

1. Select one or more alarms in the alarm state.
2. Right-click the **Alarm Control** grid and click **Ack Selected**.
3. If the selected alarms require a signature, or if you are not logged on to InTouch, then the **Ack Alarms** dialog box appears. If the Smart Card authentication system is not configured on your computer, the following dialog appears:




4. In the **Comment** box, enter or modify the alarm comment.
5. In the **Username** box, enter your user name.
6. In the **Password** box, enter your password.
7. In the **Domain** box, enter the domain and click **OK**.

   **Note:** If you enter invalid credentials, the Alarm Control displays an error message. When you click **OK**, the **ACK Alarms** dialog box appears again with the user name and the comment you had provided. You must enter the correct password.

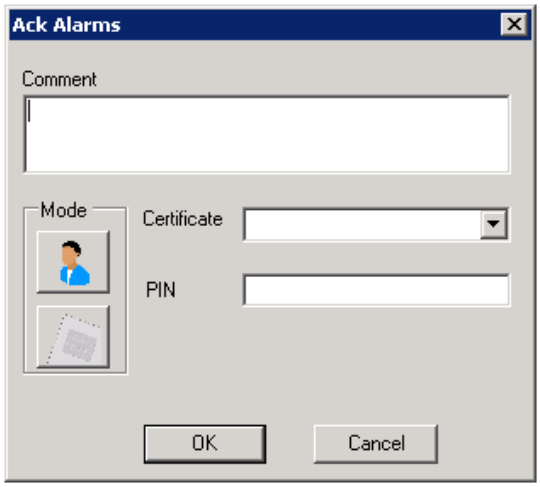
## Providing a Signature to Acknowledge Alarms Using Smart Cards

You can use a Smart Card to provide the authentication to acknowledge alarms if your computer supports Smart Card authentication. In that case, the Alarm Control displays the **Ack Alarms** dialog box with the Smart Card authentication dialog. You must have the Smart Card inserted in the Smart Card reader attached to your computer.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### To provide a signature to acknowledge alarms using Smart Cards

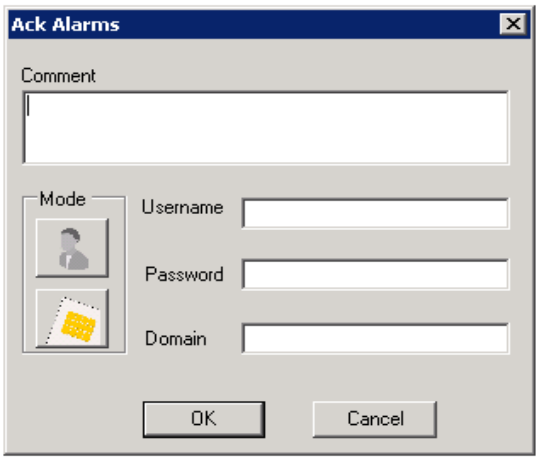
1. Select one or more alarms in an alarm state.
2. Right-click the Alarm Control grid and click **Ack Selected**.
3. If the selected alarms are configured to require a signature and if Smart Card Authentication is selected in InTouch, the **Ack Alarms** dialog box appears where the **Smart Card** button under **Mode** is disabled.




4. In the **Comment** box, enter or modify the comment.
5. From the **Certificate** list, select the Smart Card currently inserted into the reader in your system.

**Note:** If a card is newly-inserted or removed from the reader, you can update the list of cards by selecting the appropriate Smart Card from the **Certificate** list.

6. In the **PIN** box, enter the personal identification number and click **OK**.
   a. If you enter an invalid **PIN**, the system displays an error message. When you click **OK**, the **ACK Alarms** dialog box appears again with the user credential and the comment you had provided. You must enter the correct **PIN**.
   b. If you need to provide your log on credentials instead of the Smart Card details to verify your signature, click the **User Name Authentication** button under **Mode**. A different version of the **Ack Alarms** dialog box appears where the **Smart Card** button under **Mode** is enabled.




© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

## Dismissing Alarms at Run Time

When an alarm occurs, the run time operator (or system) can acknowledge the alarm to indicate that they are aware of the alarm. An acknowledged alarm that has returned to a normal value will continue to be displayed if the latching feature has been enabled for the Galaxy. With latching enabled, an acknowledged alarm that has returned to normal condition will be placed in the LATCHED alarm state.

LATCHED alarms can be displayed in the current alarms mode to show that the alarms did occur. Alarms go to the LATCHED state if:

- You ACK an alarm from UNACK_RTN state.

  Or

- You return an alarm from ACK state.

To view the LATCHED state, you have to enable the LATCHED state under the global settings. For more information, see the topic.

You can dismiss the LATCHED alarms to remove the LATCHED alarms from the current mode of the Alarm Client Control grid. The dismissed LATCHED alarms would be visible in the recent mode of the Alarm Client Control.

### To dismiss selected alarms

1. Select one or more alarms in **LATCHED** state.
2. Right-click anywhere on the grid and click **Dismiss Selected**.

The selected alarm is removed from the grid.

### To dismiss other alarms

1. Select one or more alarms in **LATCHED** state.
2. Right-click anywhere on the grid, point to **Dismiss Others**, and click one of the following options:
   - **Dismiss All** to dismiss all alarms in alarm state
   - **Dismiss Visible** to dismiss all visible alarms
   - **Dismiss Selected Groups** Groups to dismiss alarms with the same provider names and group names of one or more selected active alarms
   - **Dismiss Selected Tags** to dismiss alarms with the same provider names, group names, and tag names of one or more selected active alarms

The relevant alarms are removed from the grid.

## Shelve and Unshelve Alarms at Run Time

Operators can shelve alarms to temporarily suppress them for a fixed period. Shelving an alarm means temporarily removing it from the Alarm Control's main alarm list and placing it on a shelved list. Shelving is normally controlled by an operator to handle irrelevant nuisance alarms that have not been caught by filtering or alarm suppression mechanisms.

When shelving an alarm from the Alarm Control, operators set an associated time period in which the alarm remains shelved and enter a mandatory comment. Operators can select from a list of Alarm Control Context commands during run time to:

- Shelve one or more selected alarms

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- Shelve all alarms
- Shelve only those alarms visible in the Alarm Control
- Shelve all alarms within the same alarm group as an alarm selected from the Alarm Control
- Shelve alarms by selected tags or attributes
- Shelve alarms by selected alarm priorities
- Shelve all alarms that have the same severity as an alarm selected from the Alarm Control

When application security is used, alarms can be shelved and unshelved only by operators with proper authorization. For more information about setting shelving authorization, see Configuring the Alarm Control to Require a SHELVE Signature.

Shelved alarms are automatically unshelved at the end of the specified time period.Operators can also manually unshelve alarms and return them to an active state. Alarms are unshelved automatically at the end of the shelving time period. An unshelved alarm reappears in the Alarm Control active list and resumes its state at the time it was shelved. Operators can manually unshelve a shelved alarm before the end of the shelved period and enter an optional comment.

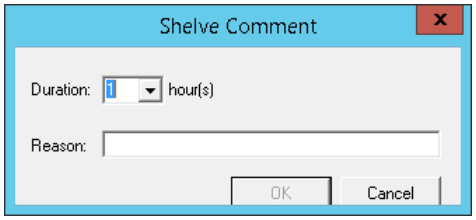
## Shelving Alarms

You can shelve alarms directly from the Alarm Control by selecting commands from the Alarm Control's Context menu.

### To shelve selected alarms using the Alarm Control

1. Select one or more alarms in alarm state.
2. Right-click the Alarm Control grid and click **Shelve Selected** from the shortcut menu.

   The **Shelve Comment** dialog box appears to set a shelf duration and enter a comment.




   **Note:** If the application runs under security and the Alarm Control has been configured to require a SHELVE signature, operators must authenticate themselves. The **Shelve Comment** dialog box includes additional fields for an operator to enter a username, password, and domain.

3. Select an alarm shelving duration from the **Duration** field.
4. Type a mandatory alarm shelving comment in the **Reason** field and click **OK**.

### To shelve other alarms using the Alarm Control

1. Select one or more alarms in alarm state.
2. Right-click the Alarm Control, point to **Shelve Others**, and click one of the following shortcut commands:
   - **Shelve All** to shelve all alarms in alarm state
   - **Shelve Visible** to shelve all visible alarms

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- **Shelve Selected Groups** to shelve alarms with the same provider names and group names of one or more selected active alarms
- **Shelve Selected Tags** to shelve alarms with the same provider names, group names, and tag names of one or more selected active alarms
- **Shelve Selected Priorities** to shelve alarms with the same provider names, group names, and within the same priority ranges of one or more selected active alarms
- **Shelve Selected Severities** to shelve alarms with the same provider names, group names, and within the same severity ranges of one or more selected active alarms

The **Shelve Comment** dialog box appears with fields to set a shelf duration and enter a comment.

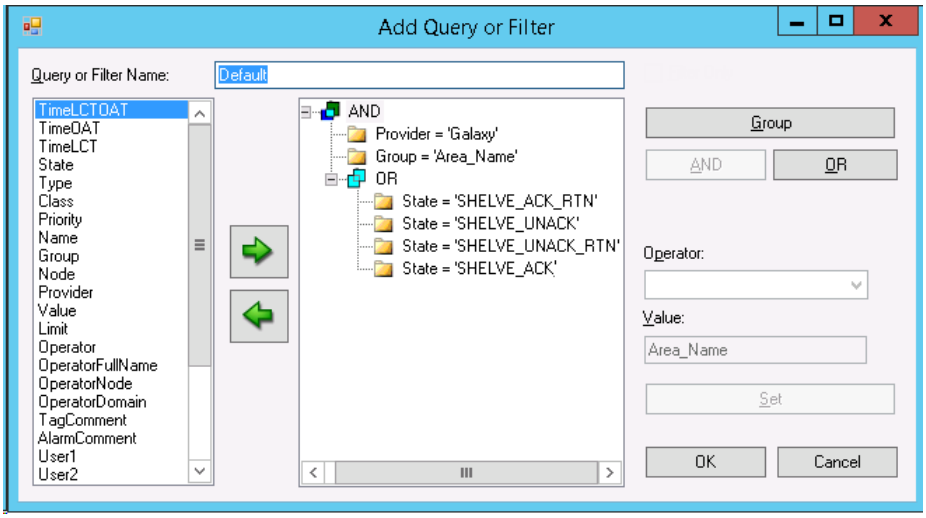
3. Select an alarm shelving duration from the **Duration** field.
4. Type an alarm shelving comment in the **Reason** field and click **OK**.

### Show Shelved Alarms

After alarms are shelved, they no longer appear as active alarms in an Alarm Control. Filters only filter active alarms, so applying only a filter will not return shelved alarms. To show shelved alarms, you must use a query and apply a filter that is configured for shelved alarms.

For example:

(Provider = 'Galaxy' AND Group = 'Area_Name' AND (State = 'SHELVE_ACK_RTN' OR State = 'SHELVE_UNACK' OR State = 'SHELVE_UNACK_RTN' OR State = 'SHELVE_ACK'))"

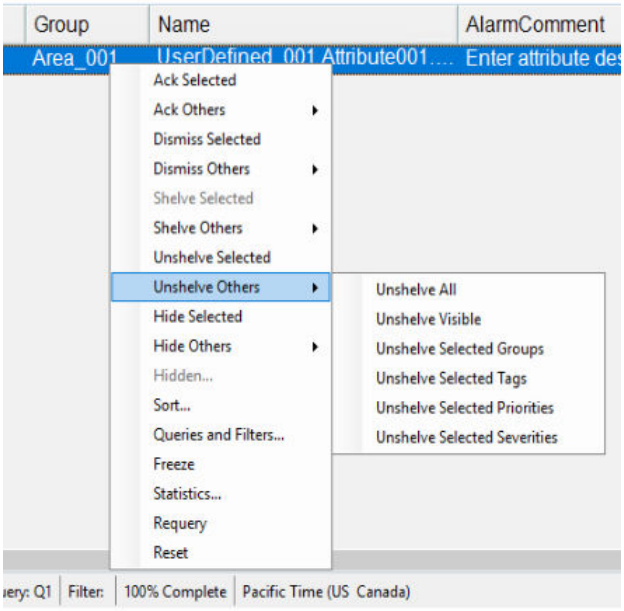



For more information about configuring queries to filter alarms, see Filter Alarms.

## Unshelve Alarms

Manually unshelving alarms follows a similar sequence of steps to shelve alarms using Context menu commands. You should have created a query that shows the current shelved alarms.

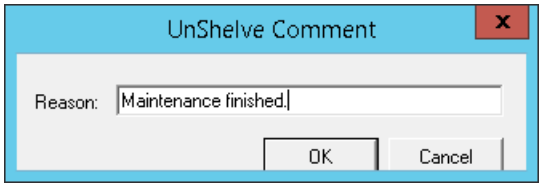
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




### To unshelve selected alarms using the Alarm Control

1. Select one or more shelved alarms.
2. Right-click the Alarm Control grid and click **Unshelve Selected** from the Context menu.

   The **Unshelve Comment** dialog box appears.




3. Type an optional alarm unshelving comment in the **Reason** field and click **OK**.

### To unshelve other alarms using the Alarm Control

1. Select one or more alarms in alarm state.
2. Right-click the Alarm Control, point to **Unshelve Others**, and click one of the following shortcut commands:
   - **Unshelve All** to unshelve all shelved alarms
   - **Unshelve Visible** to unshelve all visible shelved alarms
   - **Unshelve Selected Groups** to unshelve alarms with the same provider names and group names of one or more selected shelved alarms
   - **Unshelve Selected Tags** to unshelve alarms with the same provider names, group names, and tag names of one or more selected shelved alarms
   - **Unshelve Selected Priorities** to unshelve alarms with the same provider names, group names, and within the same priority ranges of one or more selected shelved alarms
   - **Unshelve Selected Severities** to unshelve alarms with the same provider names, group names, and within the same severity ranges of one or more selected shelved alarms

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

The **Unshelve Comment** dialog box appears.

3. Type an optional alarm unshelving comment in the **Reason** field and click **OK**.

### Sort Alarms at Run Time

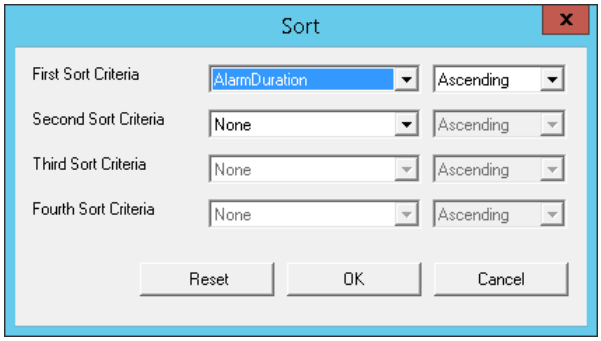
The Alarm Control supports alarm sorting for up to three columns at design time and run time. At run time, operators can configure sorting of even more columns by clicking on the column headers of the Alarm Control. You can sort alarms in ascending or descending direction for selected columns.

You can sort alarms at run time in similar way as design time. Any changes you make to the sorting at run time are lost when you switch back to design time.

**Note:** If you are sorting by the Value column, the items in the column are sorted alphabetically, not numerically. This is because the Value column can contain strings.

#### To set sorting columns and directions with lists at run time

1. Right-click the **Alarm Control** grid and click **Sort**. The **Sort** dialog box appears.




2. In the **First Sort Criteria** list, select the first sort column and a sorting direction in the list to its right.
3. Optionally, select the second sort column in the **Second Sort Criteria** list and a sorting direction in the list to its right.
4. If you set the **Second Sort Column**, optionally select the third sort column in the **Third Sort Criteria** list and a sorting direction in the list to its right.
5. Click **OK**.

#### To set sorting columns and directions in the grid at run time

1. In the Alarm Control grid, click on a column header to set sorting for the column. An arrow appears on the column header.
2. To change the sorting direction, click on the column header again. The arrow changes direction on the header.

   **Note:** If you click on a column header after releasing the **Shift** key, all sorting information is lost and the selected column is the new primary sorting criteria.

3. To set sorting for second and third columns, repeat step 3 while pressing the **Shift** key.
4. Release the **Shift** key.

## Filter Alarms at Run Time

You can filter alarms at run time by using the filters you defined at design time.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

If you did not define a filter according to your needs at design time, you can still create new filters at run time, or modify existing filters.

If you saved filters to an XML file, you can load them from a file at run time.

Filters you define at run-time are not saved for use at design-time. To re-use filters you create or modify at run-time, export the filter list to an XML file, and import the XML file at design-time.

Naming conflicts may occur between the run-time and design-time XML lists. To resolve naming conflicts between the XML files, leave the **Overwrite design time queries and filters** option checked in the **Run-Time Behaviors** tab of the **Edit Animations** dialog box. The run-time query or filter list will overwrite the design-time list and resolve the naming conflict.

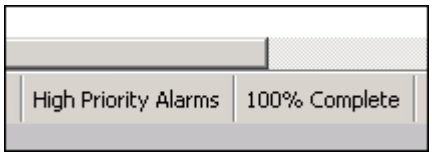
If you are showing historical alarms or events, you can use the filtering mechanism provided by the grid technology instead of using filter favorites.

## Use an Existing Query Filter

At run time, you can use any filter you defined at design time, regardless if you defined it for the current modes or historical modes. You can also use scripting to switch to an existing query filter. For more information, see Favorite Property.

### To use an existing query filter

1. Right-click the Alarm Control grid and click **Queries and Filters**. The **Queries and Filters** dialog box appears.
2. Select the filter from the list and click **OK**. The alarm records are filtered and the current filter name appears in the status bar.




## Adding a New Query or Filter at Run Time

At run time, you can create new queries or filters to limit the number of alarm records.

New queries or filters are saved and can be reused for future sessions.Upon close and restart of either the Alarm Control window or WindowViewer, added queries or filters will be available. For details see Saving Run-Time Modifications to Queries and Filters.

### To add a new query or filter at run time

1. Right-click the Alarm Control grid and click **Queries and Filters**. The **Queries and Filters** dialog box appears.
2. The configuration is the same as in design time. For more information, see Add a New Query or Filter.

## Modifying an Existing Query or Filter at Run Time

At run time, you can modify a query filter.

The modification of query filters is not saved for future use and is only valid for the current session. If you want to save the modifications, you must also export the query filters to an XML file. For more information, see Export Query and Filter Favorites.

### To modify an existing query filter

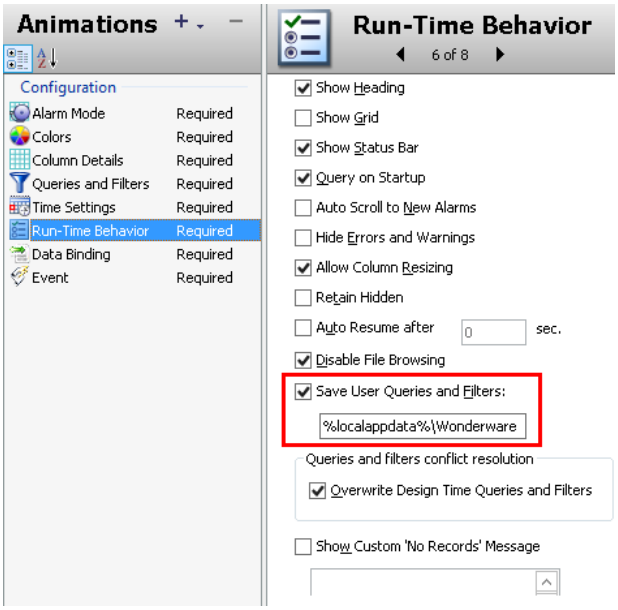
1. Right-click the Alarm Control grid and click **Query Filters**. The **Query Filters** dialog box appears.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

2. The configuration is the same as in design time. For more information, see Modify an Existing Query or Filter.

### Saving Run-Time Modifications to Queries and Filters

You can save modifications made to queries and filters at run time. There is an option to save user queries and filters in the Run-Time Behavior tab of the **Edit Animations** dialog box. It is selected by default, as shown below:




When this option is selected, modifications made to queries or filters at run-time are saved on a per user and alarm control instance to a XML file. For example, a saved query will save as UserQueryFilter_001.xml.

Modifications are saved in the following default directory:

```
C:\Users\<OS Login Name>\AppData\Local\Wonderware
```

The map between the Alarm Control instance and the above XML file is saved in a map file, "InstancesMap.dat".

Modified queries and filters will be available upon closing and restarting the alarm control window or WindowViewer.

If you uncheck the **Save User Queries and Filters** option, updates made to queries and filters during run-time will not be saved.

---

**Note:** When the **Save User Queries and Filter** option is checked, the **Overwrite Design Time Queries and Filters** option is enabled and checked by default. When checked, this option resolves naming conflicts between design-time queries and filters and run-time queries and filters loaded from the XML file. Naming conflicts will be resolved by overwriting the design time queries and filters.

---

### Deleting a Query or Filter at Run Time

At run time, you can delete a query filter.

After you delete a query or filter at run time, it is only deleted for the current session. If you want to save the list of query filters without the deleted query filter, you must export the query filters to an XML file. For more information, see Export Query and Filter Favorites.

#### To delete an existing query or filter at RunTime

1. Right-click the Alarm Control grid and click **Queries and Filters**. The **Queries and Filters** dialog box appears.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

2. The configuration is the same as in design time. For more information, see Delete a Query or Filter Favorite.

### Importing Query and Filter Favorites at Runtime

At run time, you can import the list of query filters from an XML file.

#### To import Query Filter Favorites

1. Right-click the Alarm Control grid and click **Query and Filters**. The **Query and Filters** dialog box appears.
2. The configuration is the same as in design time. For more information, see Import Query and Filter Favorites.

### Exporting Query and Filter Favorites at Runtime

At run time, you can export the list of query filters to an XML file for future use. After exporting, you can import the query filter from the XML into design time.

**Note:** The default query filter favorite is not exported to the XML file.

#### To export Query Filter Favorites

1. Right-click the Alarm Control grid and click **Query and Filters**. The **Query and Filters** dialog box appears.
2. The configuration is the same as in design time. For more information, see Export Query and Filter Favorites.

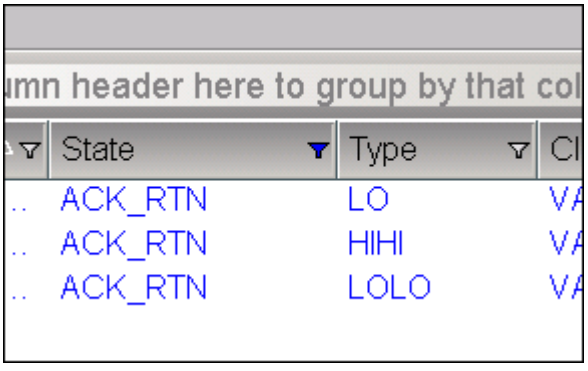
### Filtering Alarms with Client-Based Filtering

The grid technology used in the Alarm Control enables you to filter the grid contents after the data has been retrieved from the data source.

You can filter historical alarms and/or events in the following ways for any selected column:

| Filter | Description |
|---|---|
| **(All)** | No filtering, all records are shown for the selected column. |
| **(Custom)** | Lets you configure a more complex filter for the selected column, for example a filter that can compare values of different columns. |
| **(Blanks)** | Filters by showing blank values only. |
| **(NonBlanks)** | Filters by showing non blank values only. |
| **Values** | Filters by the selected value. |

If a filter is applied to any column in the Alarm Control, the filter icon in the column header appears in blue.




© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

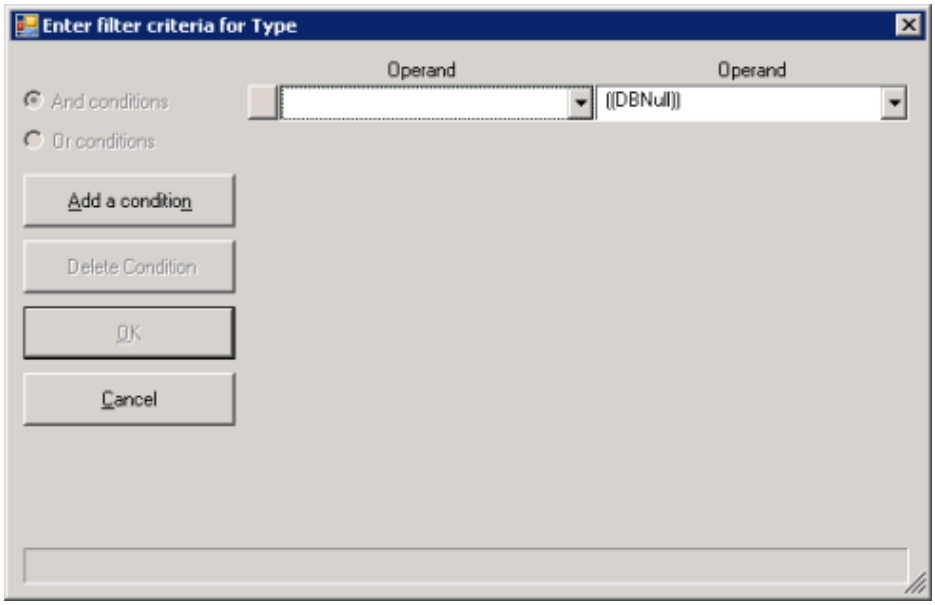
### To filter alarms with client-based filtering

1. Click the filter icon on the column you want to filter by. A menu appears.



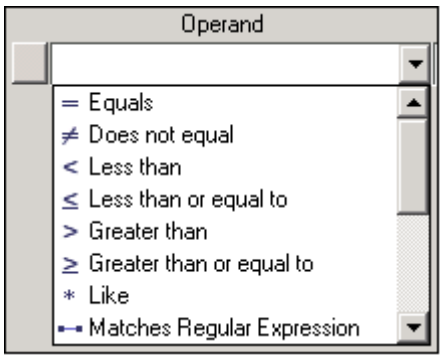

2. Select one of the following:
   - **(All)** to switch off filtering
   - **(Custom)** to define a more complex filter
   - **(Blanks)** to filter by blank values
   - **(NonBlanks)** to filter by non blank values
   - A value to filter by the value

   If you selected **(Custom)**, a dialog box appears.

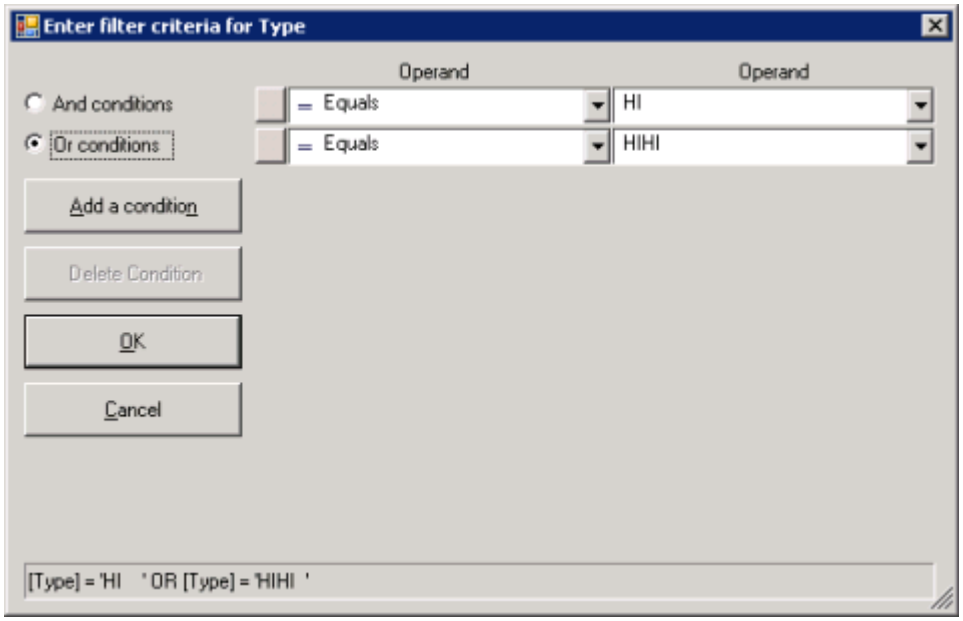



3. Do one of the following:
   - Select a different operator for the current condition

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




- Type or select a different operand for the current condition. The operand can be a value, or the value of a different column in the same row
- Click **Add a condition** to add more conditions to the filter




- Click **Delete Condition** to delete one or more selected conditions (You can mark the condition by clicking on the button to the left of each condition.)

4. Click **OK**.

## Reset the Grid

You can reset the Alarm Control's column widths, column order, and names to their last design-time values. When you reset the grid, the query filter is also reset to its default. You can also reset the grid by using the Reset() Method in scripting.

### To reset the grid

- Right-click the Alarm Control grid and click **Reset**

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

## Hide Alarms

The "hiding" and "unhiding" of alarm records is known in the corresponding InTouch alarm controls as "suppressing" and "unsuppressing".

When the Alarm Control is hiding alarms, it ignores certain alarms. If an alarm matches the exclusion criteria, it is not visible.

The actual alarm generation is completely unaffected by hiding. Alarm records are still logged into the alarm history.

You can hide:

- All alarms, including alarms not visible due to the limited space of the Alarm Control
- All visible alarms
- One or more selected alarms
- All alarms with the same provider names and group names of one or more selected alarms
- All alarms with the same provider names, group names, and within the priority ranges of one or more selected alarms
- All alarms with the same provider names, group names, and tag names within the priority ranges of one or more selected alarms

You can also view which alarms are hidden and unhide them.

### To hide all alarms

- Right-click the Alarm Control grid, point to **Hide Others**, and click **Hide All**

### To hide all visible alarms

- Right-click the Alarm Control grid, point to **Hide Others**, and click **Hide Visible**

### To hide selected alarms

1. Select one or more alarms in alarm state.
2. Right-click the Alarm Control grid and click **Hide Selected**.

### To hide alarms with common parameters

1. Select one or more alarms.
2. Right-click the Alarm Control grid, point to **Hide Others**, and click one of the following:
    - **Hide Selected Groups** to hide alarms with the same provider names and group names of one or more selected alarms
    - **Hide Selected Tags** to hide alarms with the same provider names, group names, and tag names within the priority ranges of one or more selected alarms
    - **Hide Selected Priorities** to hide alarms with the same provider names, group names, and within the priority ranges of one or more selected alarms

### To unhide alarms

1. Right-click the Alarm Control grid and click **Hidden**. The **Hidden Alarms** dialog box appears.
2. Select the alarms you want to unhide and click **Unhide**.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

3. Click **Close**.

## Freeze and Unfreeze the Alarm Control Grid

You can freeze the Alarm Control to prevent the Alarm control tree from being updated with any further changes.

For example, if new alarms occur while the Alarm Control is frozen, the new alarms are only shown after you unfreeze the Alarm Control.

You can configure a time period after which the Alarm Control automatically unfreezes to avoid the Alarm Control being unknowingly frozen. For example, the operator leaves the workstation and returns without realizing that the Alarm Control is still frozen.

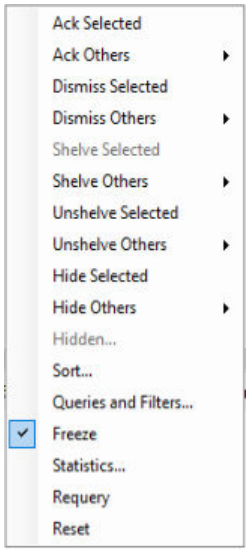
The Alarm Control unfreezes automatically if one of the following changes:

- Alarm Mode
- Alarm Query
- Query Filter

After you unfreeze the Alarm Control, the grid updates with the new alarm records and any other updates while the grid was frozen. You can also use scripting to freeze and unfreeze the Alarm Control grid at run time. For more information, see FreezeDisplay() Method.

**To freeze or unfreeze the Alarm Control grid**

1. Right-click the Alarm Control grid. The shortcut menu appears.




   A check mark next to the **Freeze** option indicates if the grid is currently frozen.

2. Click **Freeze**. The Alarm Control grid is either frozen or unfrozen.

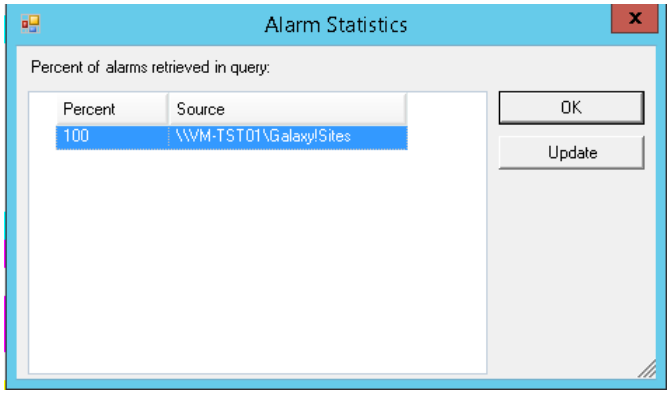
## Show Alarm Statistics

You can view alarm statistics at run time to see which alarm providers are providing the alarm data. For more information, see Show.Statistics() Method.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### To show alarm statistics

1. Right-click the Alarm Control grid and click **Statistics**. The **Alarm Statistics** dialog box appears.




2. If you use an Alarm Hotbackup name as alarm query, you can expand the Hotbackup name in the **Alarm Statistics** dialog box to show the individual percentages of retrieval for the configured primary and backup alarm provider.
3. Click **Update** to update the statistics.
4. Click **Close**.

## Switching between Client Modes

You can switch between client modes at run time by changing the Alarm Control ClientMode property. The easiest way to do this, is to configure an application server script to interact with the Alarm Control ClientMode property at design time.

### To switch between client modes

1. Place the Alarm Control on the Industrial graphic.
2. Paste a button on the canvas and change its caption to **Current Alarms**.
3. Double-click the button and configure it with the following action script:
```
AlarmControlGrid1.ClientMode = 1;
```
4. Click **OK**.
5. Repeat steps 2 to 4 for the following buttons:

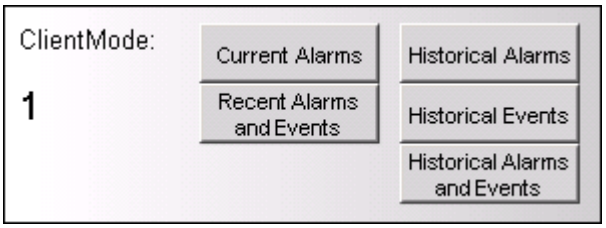
| Button Caption | Action script |
|---|---|
| Recent Alarms and Events | `AlarmControlGrid1.ClientMode = 2;` |
| Historical Alarms | `AlarmControlGrid1.ClientMode = 3;` |
| Historical Events | `AlarmControlGrid1.ClientMode = 4;` |
| Historical Alarms and Events | `AlarmControlGrid1.ClientMode = 5;` |

6. Save and close the Industrial graphic.
7. Create a new managed InTouch application and open it in WindowMaker.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

8. Place the Industrial graphic on a new InTouch window.

9. Switch to WindowViewer to test your application.




10. Click **Historical Alarms** to show historical alarms instead of current alarms.

By default, the Alarm Control tries to connect to the alarm database (either the InTouch Database called WWALMDB or the ArchestrA Database called A2ALMDB) on the local computer using the currently logged on user. If you are using a different configuration, you can use value input links or action script to set the following properties:

- Database.ServerName Property
- Database.UserID Property
- Database.Password Property
- Domain Property
- Database.Name Property
- Database.Authentication Property

## Switching Run-Time Languages

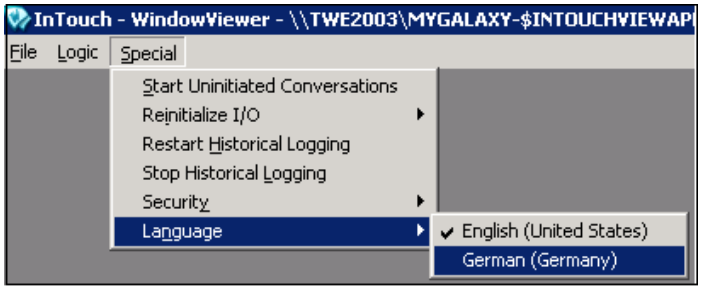
You can switch the language of the Alarm Control in the same way as other parts of your InTouch application. When you switch language, the alarm state, alarm class, alarm type, the various alarm comment fields, the column headers, and the status bar messages are switched to the selected language.

You can also run queries and scripts, which return results in the selected language

### To switch the language

Do one of the following:

- In WindowViewer on the **Special** menu, point to **Languages**, and then click the language you want to switch to




- In WindowMaker, use the InTouch QuickScript **SwitchDisplayLanguage** in a button action script to switch the language. At run time, click the button to switch the language

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- In WindowMaker, use the system tag $Language in a button action script and assign it to the language code you want to switch to. At run time, click the button to switch the language

For more information about run-time language switching, see *Working with Languages*, in the *Application Server User's Guide*.

**Important**: If you rename or reorder column headers, you must repeat the symbol text translation procedures. If you do not, your changes will not be available for run-time language switching.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Scripting the Alarm Control

This section describes the script properties, methods, and events of the Alarm Control.

## Alarm Control Properties

This section describes the properties available for scripting in the Alarm Control.

### AckComment.DefaultValue Property

The AckComment.DefaultValue property is a read-write string property that gets or sets the default acknowledgement comment when the AckComment.UseDefault property is TRUE.

**Syntax**

```
result = AlarmClient.AckComment.DefaultValue;
AlarmClient.AckComment.DefaultValue = ackComment;
```

**Example**

```
AlarmClient1.AckComment.UseDefault = 1;
AlarmClient1.AckComment.DefaultValue = "This alarm is acknowledged by John Smith";
```

**Remarks**

For more information, see Showing Current Alarms or Recent Alarms and Events.

### AckComment.UseDefault Property

The AckComment.UseDefault property is a read-write Boolean property that gets or sets the usage of the default acknowledgement comment.

**Syntax**

```
result = AlarmClient.AckComment.UseDefault;
AlarmClient.AckComment.UseDefault = useComment;
```

**Example**

```
AlarmClient1.AckComment.UseDefault = 1;
AlarmClient1.AckComment.DefaultValue = "This alarm is acknowledged by John Smith";
```

**Remarks**

For more information, see Showing Current Alarms or Recent Alarms and Events.

### AckSignature.MaxPriority Property

The AckSignature.MaxPriority property is a read-write integer property, which gets or sets the maximum priority value for alarms that require a signature to be acknowledged. The value must range between 1 and 999, and must be greater than or equal to the AckSignature.MinPriority value. The default value of AckSignature.MaxPriority is 999.

**Syntax**

```
To Set:
<EAC instance name>.<Property Name> = <integer value>;
```

**Example**

```
AlarmClient1.AckSignature.MaxPriority = 500;
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

**Syntax:**

```
To Get:
integer <variable name> = <EAC instance name>.<Property Name>;
```

**Example**

```
dim iMax as integer;
iMax = AlarmClient1.AckSignature.MaxPriority;
```

**Remarks**

For more information, see Provide a Signature to Acknowledge Alarms.

### AckSignature.MinPriority Property

The AckSignature.MinPriority property is a read-write integer property, which gets or sets the minimum priority value for alarms that require a signature to be acknowledged. The value must range between 1 and 999, and must be less than or equal to the AckSignature.MaxPriority value. The default value of AckSignature.MinPriority is 1.

**Syntax**

```
To Set:
<EAC instance name>.<Property Name> = <integer value>;
```

**Example**

```
AlarmClient1.AckSignature.MinPriority = 100;
```

**Syntax**

```
To Get:
To Get:
integer <variable name> = <EAC instance name>.<Property Name>;
```

**Example**

```
dim iMin as integer;
iMin = AlarmClient1.AckSignature.MinPriority;
```

**Remarks**

For more information, see Provide a Signature to Acknowledge Alarms.

### AckSignature.Required Property

The AckSignature.Required property is a read-write Boolean property, indicating whether a signature is required for acknowledging the alarms. The default value of AckSignature.MinPriority is True.

**Syntax**

```
To Set:
<EAC instance name>.<Property Name> = <boolean value>;
```

**Example**

```
AlarmClient1.AckSignature.Required = true;
```

**Syntax**

```
To Get:
boolean <variable name> = <EAC instance name>.<Property Name>;
```

**Example**

```
dim bIsACKSigned as boolean;
bIsACKSigned  = AlarmClient1.AckSignature.Required;
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Remarks

For more information, see Configuring the Alarm Control to Require a SHELVE Signature

## AlarmColor.Ack.BackGround Property

The AlarmColor.Ack.BackGround property is an array of read-write integer properties that get or set the background colors of all acknowledged alarm records.

| Index | Purpose |
|---|---|
| 0 | Sets the background color of all acknowledged alarm records in all priority ranges. |
| 1 | Gets or sets the background color of acknowledged alarm records in the priority range 1 to AlarmColor.Range[1]. |
| 2 | Gets or sets the background color of acknowledged alarm records in the priority range AlarmColor.Range[1] to AlarmColor.Range[2]. |
| 3 | Gets or sets the background color of acknowledged alarm records in the priority range AlarmColor.Range[2] to AlarmColor.Range[3]. |
| 4 | Gets or sets the background color of acknowledged alarm records in the priority range AlarmColor.Range[3] to 999. |

### Syntax

```
Color = AlarmClient.AlarmColor.Ack.BackGround[n];
AlarmClient.AlarmColor.Ack.BackGround[n] = Color;
```

### Parameters

*n*
Index from 0 to 4.

*Color*
Color of background.

### Examples

```
AlarmClient1.AlarmColor.Ack.BackGround[0] = Color.Red;
AlarmClient1.AlarmColor.Ack.BackGround[1] = Color.FromARGB(0,128,0);
AlarmClient1.AlarmColor.Ack.BackGround[2] = Color.Grey;
AlarmClient1.AlarmColor.Ack.BackGround[3] = Color.Yellow;
AlarmClient1.AlarmColor.Ack.BackGround[4] = Color.Black;
```

### Remarks

*Color* is a .NET Framework data type. You can use various Color methods to set the color, such as a predefined color name, FromARGB(), FromKnownColor(), and FromName().

For a list of the .NET color names and the hexadecimal codes, see .NET Colors.

For more information on the color methods, see the online Microsoft documentation for .NET Framework Development.

## AlarmColor.Ack.ForeGround Property

The AlarmColor.Ack.ForeGround property is an array of read-write integer properties that get or set the text colors of all acknowledged alarm records.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Index | Purpose |
|---|---|
| 0 | Sets the text color of all acknowledged alarm records in all priority ranges. |
| 1 | Gets or sets the text color of acknowledged alarm records in the priority range 1 to AlarmColor.Range[1]. |
| 2 | Gets or sets the text color of acknowledged alarm records in the priority range AlarmColor.Range[1] to AlarmColor.Range[2]. |
| 3 | Gets or sets the text color of acknowledged alarm records in the priority range AlarmColor.Range[2] to AlarmColor.Range[3]. |
| 4 | Gets or sets the text color of acknowledged alarm records in the priority range AlarmColor.Range[3] to 999. |

### Syntax

```
Color = AlarmClient.AlarmColor.Ack.ForeGround[n];
AlarmClient.AlarmColor.Ack.ForeGround[n] = Color;
```

### Parameters

*n*
Index from 0 to 4.

*Color*
Color of text.

### Examples

```
AlarmClient1.AlarmColor.Ack.ForeGround[0] = Color.Black;
AlarmClient1.AlarmColor.Ack.ForeGround[1] = Color.Blue;
AlarmClient1.AlarmColor.Ack.ForeGround[2] = Color.Green;
AlarmClient1.AlarmColor.Ack.ForeGround[3] = Color.Yellow;
AlarmClient1.AlarmColor.Ack.ForeGround[4] = Color.FromARGB(0,128,0);
```

### Remarks

*Color* is a .NET Framework data type. You can use various Color methods to set the color, such as a predefined color name, FromARGB(), FromKnownColor(), and FromName().

For a list of the .NET color names and the hexadecimal codes, see .NET Colors.

For more information on the color methods, see the online Microsoft documentation for .NET Framework Development.

## AlarmColor.Ack.RTN.BackGround Property

The AlarmColor.Ack.RTN.BackGround property is a read-write color property that gets or sets the background color of acknowledged alarm records that "return to normal" (ACK_RTN).

### Syntax

```
Color = AlarmClient.AlarmColor.Ack.RTN.BackGround;
AlarmClient.AlarmColor.Ack.RTN.BackGround = Color;
```

### Parameters

*Color*

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

Color of background.

### Return Value

Returns the background color of acknowledged alarms that "return to normal".

### Example

```
AlarmClient1.AlarmColor.Ack.RTN.BackGround = Color.Blue;
```

### Remarks

*Color* is a .NET Framework data type. You can use various Color methods to set the color, such as a predefined color name, FromARGB(), FromKnownColor(), and FromName().

For a list of the .NET color names and the hexadecimal codes, see .NET Colors.

For more information on the color methods, see the online Microsoft documentation for .NET Framework Development.

## AlarmColor.Ack.RTN.ForeGround Property

The AlarmColor.Ack.RTN.ForeGround property is a read-write color property that gets or sets the text color of acknowledged alarm records that "return to normal" (ACK_RTN).

### Syntax

```
Color = AlarmClient.AlarmColor.Ack.RTN.ForeGround;
AlarmClient.AlarmColor.Ack.RTN.ForeGround = Color;
```

### Parameters

*Color*
Color of text.

### Example

```
AlarmClient1.AlarmColor.Ack.RTN.ForeGround = Color.Black;
```

### Remarks

*Color* is a .NET Framework data type. You can use various Color methods to set the color, such as a predefined color name, FromARGB(), FromKnownColor(), and FromName().

For a list of the .NET color names and the hexadecimal codes, see .NET Colors.

For more information on the color methods, see the online Microsoft documentation for .NET Framework Development.

## AlarmColor.Range Property

The AlarmColor.Range property is an array of read-write integer properties that get or set the boundaries of the priority ranges.

You can use priority ranges to classify, group, and emphasize alarms and events belonging to a certain priority range.

The boundaries must fulfill the following condition:

1 < Range[1] < Range[2] < Range[3] < 999

By default, the boundaries are set as follows:

| | |
|---|---|
| • AlarmColor.Range[1] | 250 |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| • AlarmColor.Range[2] | 500 |
| • AlarmColor.Range[3] | 750 |

### Syntax

```
RangeN = AlarmClient.AlarmColor.Range[N];
AlarmClient.AlarmColor.Range[1] = RangeN;
```

### Parameters

*N*
Range index 1, 2, or 3.

### Example

The following example defines four priority ranges (1 to 50, 51 to 600, 601 to 800, and 801 to 999):

```
AlarmClient1.AlarmColor.Range[1] = 50;
AlarmClient1.AlarmColor.Range[2] = 600;
AlarmClient1.AlarmColor.Range[3] = 800;
```

### Remarks

For more information, see Set Priority Ranges for Alarm Records

## AlarmColor.RTN.BackGround Property

The AlarmColor.RTN.BackGround property is a read-write color property that gets or sets the background color of alarm records that "return to normal" (ACK_RTN and UNACK_RTN).

### Syntax

```
Color = AlarmClient.AlarmColor.RTN.BackGround;
AlarmClient.AlarmColor.RTN.BackGround = Color;
```

### Parameters

Color

Color of background.

### Example

```
AlarmClient1.AlarmColor.RTN.BackGround = Color.Blue;
```

### Remarks

For more information, see Set Alarm Return To Normal Record Colors.

C*olor* is a .NET Framework data type. You can use various Color methods to set the color, such as a predefined color name, FromARGB(), FromKnownColor(), and FromName().

For a list of the .NET color names and the hexadecimal codes, see .NET Colors.

For more information on the color methods, see the online Microsoft documentation for .NET Framework Development.

## AlarmColor.RTN.ForeGround Property

The AlarmColor.RTN.ForeGround property is a read-write color property that gets or sets the text color of alarm records that "return to normal" (ACK_RTN and UNACK_RTN).

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Syntax

```
Color = AlarmClient.AlarmColor.RTN.ForeGround;
AlarmClient.AlarmColor.RTN.ForeGround = Color;
```

### Parameters

*Color*
Color of text.

### Example

```
AlarmClient1.AlarmColor.RTN.ForeGround = Color.Yellow;
```

### Remarks

For more information, see Set Alarm Return To Normal Record Colors.

*Color* is a .NET Framework data type. You can use various Color methods to set the color, such as a predefined color name, FromARGB(), FromKnownColor(), and FromName().

For a list of the .NET color names and the hexadecimal codes, see .NET Colors.

For more information on the color methods, see the online Microsoft documentation for .NET Framework Development.

## AlarmColor.UnAck.BackGround Property

The AlarmColor.UnAck.BackGround property is an array of read-write integer properties that get or set the background colors of all unacknowledged alarm records.

| Index | Purpose |
|---|---|
| 0 | Sets the background color of all unacknowledged alarm records in all priority ranges. |
| 1 | Gets or sets the background color of unacknowledged alarm records in the priority range 1 to AlarmColor.Range[1]. |
| 2 | Gets or sets the background color of unacknowledged alarm records in the priority range AlarmColor.Range[1] to AlarmColor.Range[2]. |
| 3 | Gets or sets the background color of unacknowledged alarm records in the priority range AlarmColor.Range[2] to AlarmColor.Range[3]. |
| 4 | Gets or sets the background color of unacknowledged alarm records in the priority range AlarmColor.Range[3] to 999. |

### Syntax

```
Color = AlarmClient.AlarmColor.UnAck.BackGround[n];
AlarmClient.AlarmColor.UnAck.BackGround[n] = Color;
```

### Parameters

*n*
Index from 0 to 4.

*Color*
Color of background.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Example

```
AlarmClient1.AlarmColor.UnAck.BackGround[0] = Color.Blue;
AlarmClient1.AlarmColor.UnAck.BackGround[1] = Color.ARGB(223,113,76);
AlarmClient1.AlarmColor.UnAck.BackGround[2] = Color.Yellow;
AlarmClient1.AlarmColor.UnAck.BackGround[3] = Color.Green;
AlarmClient1.AlarmColor.UnAck.BackGround[4] = Color.White;
```

### Remarks

*Color* is a .NET Framework data type. You can use various Color methods to set the color, such as a predefined color name, FromARGB(), FromKnownColor(), and FromName().

For a list of the .NET color names and the hexadecimal codes, see .NET Colors

For more information on the color methods, see the online Microsoft documentation for .NET Framework Development.

## AlarmColor.UnAck.Flash.BackGround Property

The AlarmColor.UnAck.Flash.BackGround property is an array of read-write color properties that get or set the background colors of all flashing unacknowledged alarm records.

| Index | Purpose |
|---|---|
| 0 | Sets the background color of all flashing unacknowledged alarm records in all priority ranges. |
| 1 | Gets or sets the background color of flashing unacknowledged alarm records in the priority range 1 to AlarmColor.Range[1]. |
| 2 | Gets or sets the background color of flashing unacknowledged alarm records in the priority range AlarmColor.Range[1] to AlarmColor.Range[2]. |
| 3 | Gets or sets the background color of flashing unacknowledged alarm records in the priority range AlarmColor.Range[2] to AlarmColor.Range[3]. |
| 4 | Gets or sets the background color of flashing unacknowledged alarm records in the priority range AlarmColor.Range[3] to 999. |

### Syntax

```
Color = AlarmClient.AlarmColor.UnAck.Flash.BackGround[n];
AlarmClient.AlarmColor.UnAck.Flash.BackGround[n] = Color;
```

### Parameters

*n*
Index from 1 to 4.

*Color*
Color of background.

### Example

```
AlarmClient1.AlarmColor.UnAck.Flash.BackGround[1] = Color.ARGB(223,113,76);
AlarmClient1.AlarmColor.UnAck.Flash.BackGround[2] = Color.Yellow;
AlarmClient1.AlarmColor.UnAck.Flash.BackGround[3] = Color.Green;
AlarmClient1.AlarmColor.UnAck.Flash.BackGround[4] = Color.White;
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Remarks

*Color* is a .NET Framework data type. You can use various Color methods to set the color, such as a predefined color name, FromARGB(), FromKnownColor(), and FromName().

For a list of the .NET color names and the hexadecimal codes, see .NET Colors

For more information on the color methods, see the online Microsoft documentation for .NET Framework Development.

## AlarmColor.UnAck.Flash.ForeGround Property

The AlarmColor.UnAck.Flash.ForeGround property is an array of read-write color properties that get or set the text colors of all flashing unacknowledged alarm records.

| Index | Purpose |
|---|---|
| 0 | Sets the text color of all flashing unacknowledged alarm records in all priority ranges. |
| 1 | Gets or sets the text color of flashing unacknowledged alarm records in the priority range 1 to AlarmColor.Range[1]. |
| 2 | Gets or sets the text color of flashing unacknowledged alarm records in the priority range AlarmColor.Range[1] to AlarmColor.Range[2]. |
| 3 | Gets or sets the text color of flashing unacknowledged alarm records in the priority range AlarmColor.Range[2] to AlarmColor.Range[3]. |
| 4 | Gets or sets the text color of flashing unacknowledged alarm records in the priority range AlarmColor.Range[3] to 999. |

### Syntax

```
Color = AlarmClient.AlarmColor.UnAck.Flash.ForeGround[n];
AlarmClient.AlarmColor.UnAck.Flash.ForeGround[n] = Color;
```

### Parameters

*n*
Index from 1 to 4.

*Color*
Color of text.

### Examples

```
AlarmClient1.AlarmColor.UnAck.Flash.ForeGround[1] = Color.ARGB(223,113,76);
AlarmClient1.AlarmColor.UnAck.Flash.ForeGround[2] = Color.Yellow;
AlarmClient1.AlarmColor.UnAck.Flash.ForeGround[3] = Color.Green;
AlarmClient1.AlarmColor.UnAck.Flash.ForeGround[4] = Color.White;
```

### Remarks

*Color* is a .NET Framework data type. You can use various Color methods to set the color, such as a predefined color name, FromARGB(), FromKnownColor(), and FromName().

For a list of the .NET color names and the hexadecimal codes, see .NET Colors

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

For more information on the color methods, see the online Microsoft documentation for .NET Framework Development.

## AlarmColor.UnAck.ForeGround Property

The AlarmColor.UnAck.ForeGround property is an array of read-write integer properties that get or set the text colors of all unacknowledged alarm records.

| Index | Purpose |
|---|---|
| 0 | Sets the text color of all unacknowledged alarm records in all priority ranges. |
| 1 | Gets or sets the text color of unacknowledged alarm records in the priority range 1 to AlarmColor.Range[1]. |
| 2 | Gets or sets the text color of unacknowledged alarm records in the priority range AlarmColor.Range[1] to AlarmColor.Range[2]. |
| 3 | Gets or sets the text color of unacknowledged alarm records in the priority range AlarmColor.Range[2] to AlarmColor.Range[3]. |
| 4 | Gets or sets the text color of unacknowledged alarm records in the priority range AlarmColor.Range[3] to 999. |

### Syntax

```
Color = AlarmClient.AlarmColor.UnAck.ForeGround[n];
AlarmClient.AlarmColor.UnAck.ForeGround[n] = Color;
```

### Parameters

*n*
Index from 0 to 4.

*Color*
Color of text.

### Example

```
AlarmClient1.AlarmColor.UnAck.ForeGround[0] = Color.Blue;
AlarmClient1.AlarmColor.UnAck.ForeGround[1] = Color.ARGB(223,113,76);
AlarmClient1.AlarmColor.UnAck.ForeGround[2] = Color.Yellow;
AlarmClient1.AlarmColor.UnAck.ForeGround[3] = Color.Green;
AlarmClient1.AlarmColor.UnAck.ForeGround[4] = Color.White;
```

### Remarks

*Color* is a .NET Framework data type. You can use various Color methods to set the color, such as a predefined color name, FromARGB(), FromKnownColor(), and FromName().

For a list of the .NET color names and the hexadecimal codes, see .NET Colors

For more information on the color methods, see the online Microsoft documentation for .NET Framework Development.

## AlarmColor.UnAck.RTN.BackGround Property

The AlarmColor.UnAck.RTN.BackGround property is a read-write color property that gets or sets the background color of unacknowledged alarm records that "return to normal" (UNACK_RTN).

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Syntax

```
Color = AlarmClient.AlarmColor.UnAck.RTN.BackGround;
AlarmClient.AlarmColor.UnAck.RTN.BackGround = Color;
```

### Parameters

*Color*
Color of background.

### Example

```
AlarmClient1.AlarmColor.UnAck.RTN.BackGround = Color.Blue;
```

### Remarks

*Color* is a .NET Framework data type. You can use various Color methods to set the color, such as a predefined color name, FromARGB(), FromKnownColor(), and FromName().

For a list of the .NET color names and the hexadecimal codes, see .NET Colors

For more information on the color methods, see the online Microsoft documentation for .NET Framework Development.

## AlarmColor.UnAck.RTN.ForeGround Property

The AlarmColor.UnAck.RTN.ForeGround property is a read-write color property that gets or sets the text color of unacknowledged alarm records that "return to normal" (UNACK_RTN).

### Syntax

```
Color = AlarmClient.AlarmColor.UnAck.RTN.ForeGround;
AlarmClient.AlarmColor.UnAck.RTN.ForeGround = Color;
```

### Parameters

*Color*
Color of text.

### Example

```
AlarmClient1.AlarmColor.UnAck.RTN.ForeGround = Color.FromARGB(0,0,0);
```

### Remarks

*Color* is a .NET Framework data type. You can use various Color methods to set the color, such as a predefined color name, FromARGB(), FromKnownColor(), and FromName().

For a list of the .NET color names and the hexadecimal codes, see .NET Colors

For more information on the color methods, see the online Microsoft documentation for .NET Framework Development.

## AlarmQuery Property

The AlarmQuery property is a read-write string property that gets or sets the selected alarm query.

### Syntax

```
result = AlarmClient.AlarmQuery;
AlarmClient.AlarmQuery = AlmQry;
```

### Parameters

*AlmQry*

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

Alarm query string in format \\node\provider!group where node is optional.

**Example**

```
AlarmClient.AlarmQuery = "\intouch!GroupA";
```

**Remarks**

When a new query is selected the AlarmQuery property is updated with the selected query. The selected query will be updated if a new query string is written to the AlarmQuery property.

### AllowColumnResize Property

The AllowColumnResize property is a read-write Boolean property that gets or sets the ability to resize the columns at run time.

**Syntax**

```
result = AlarmClient.AllowColumnResize;
AlarmClient.AllowColumnResize = allowColResizing;
```

### AutoResumeDuration Property

The AutoResumeDuration property is a read-write integer property that gets or sets the time in seconds after which the grid becomes unfrozen and resumes showing alarms.

Set this value to 0 to disable auto resume.

**Syntax**

```
result = AlarmClient.AutoResumeDuration;
AlarmClient.AllowColumnResize = timeout;
```

### AutoScroll Property

The AutoScroll property is a read-write Boolean property that gets or sets automatic scrolling to new alarms.

**Syntax**

```
result = AlarmClient.AutoScroll;
AlarmClient.AutoScroll = allowAutoscroll;
```

### ClientMode Property

The ClientMode property is a read-write integer property that gets or sets the client mode for the Alarm Control. Use one of the following values:

| Value | Client Mode |
|---|---|
| 1 | Current Alarms |
| 2 | Recent Alarms and Events |
| 3 | Historical Alarms |
| 4 | Historical Events |
| 5 | Historical Alarms and Events |

**Syntax**

```
result = AlarmClient.ClientMode;
AlarmClient.ClientMode = clientMode;
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Example

```
AlarmClient1.ClientMode = 2;
LogMessage("Alarm client set to Recent Alarms and Events");
```

### Remarks

For more information, see Showing Current Alarms or Recent Alarms and Events.

## ConnectStatus Property

The ConnectStatus property is a read-only string property that gets the status of the connection to the Alarm Database.

### Syntax

```
result = AlarmClient.ConnectStatus;
```

### Return Value

Returns the status of the connection to the alarm database. Can be "Connected," "Not connected," or "In progress."

### Example

```
alive = AlarmClient1.ConnectStatus;
if alive == "Connected" then
   LogMessage("The Alarm Control is currently connected to the Alarm Database");
else
   LogMessage("The Alarm Control is either currently connecting to the Alarm Database or
   not connected.");
endif;
```

## ContextMenu.AckAll Property

The ContextMenu.AckAll property is a read-write Boolean property that gets or sets the appearance of the **Ack All** option on the shortcut menu.

### Syntax

```
result = AlarmClient.ContextMenu.AckAll;
AlarmClient.ContextMenu.AckAll = AckAllVis;
```

### Remarks

For more information, see Configuring the Run-Time Shortcut Menu.

## ContextMenu.AckOthers Property

The ContextMenu.AckOthers property is a read-write Boolean property that gets or sets the appearance of the **Ack Others** option on the shortcut menu.

### Syntax

```
result = AlarmClient.ContextMenu.AckOthers;
AlarmClient.ContextMenu.AckOthers = AckOthersVis;
```

### Remarks

For more information, see Configuring the Run-Time Shortcut Menu.

## ContextMenu.AckSelected Property

The ContextMenu.AckSelected property is a read-write Boolean property that gets or sets the appearance of the **Ack Selected** option on the shortcut menu.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

**Syntax**

```
result = AlarmClient.ContextMenu.AckSelected;
AlarmClient.ContextMenu.AckSelected = AckSelectedVis;
```

**Remarks**

For more information, see Configuring the Run-Time Shortcut Menu.

### ContextMenu.AckSelectedGroups Property

The ContextMenu.AckSelectedGroups property is a read-write Boolean property that gets or sets the appearance of the **Ack Selected Groups** option on the shortcut menu.

**Syntax**

```
result = AlarmClient.ContextMenu.AckSelectedGroups;
AlarmClient.ContextMenu.AckSelectedGroups = AckSelGrpsVis;
```

**Remarks**

For more information, see Configuring the Run-Time Shortcut Menu.

### ContextMenu.AckSelectedPriorities Property

The ContextMenu.AckSelectedPriorities property is a read-write Boolean property that gets or sets the appearance of the **Ack Selected Priorities** option on the shortcut menu.

**Syntax**

```
result = AlarmClient.ContextMenu.AckSelectedPriorities;
AlarmClient.ContextMenu.AckSelectedPriorities = AckSelPriVis;
```

**Remarks**

For more information, see Configuring the Run-Time Shortcut Menu.

### ContextMenu.AckSelectedTags Property

The ContextMenu.AckSelectedTags property is a read-write Boolean property that gets or sets the appearance of the **Ack Selected Tags** option on the shortcut menu.

**Syntax**

```
result = AlarmClient.ContextMenu.AckSelectedTags;
AlarmClient.ContextMenu.AckSelectedTags = AckSelTagsVis;
```

**Remarks**

For more information, see Configuring the Run-Time Shortcut Menu.

### ContextMenu.AckVisible Property

The ContextMenu.AckVisible property is a read-write Boolean property that gets or sets the appearance of the **Ack Visible** option on the shortcut menu.

**Syntax**

```
result = AlarmClient.ContextMenu.AckVisible;
AlarmClient.ContextMenu.AckVisible = AckVisVis;
```

**Remarks**

For more information, see Configuring the Run-Time Shortcut Menu..

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### ContextMenu.Favorites Property

The ContextMenu.Favorites property is a read-write Boolean property that gets or sets the appearance of the **Query and Filter Favorites** option on the shortcut menu.

#### Syntax

```
result = AlarmClient.ContextMenu.Favorites;
AlarmClient.ContextMenu.Favorites = FavsVis;
```

#### Remarks

For more information, see Configuring the Run-Time Shortcut Menu.

### ContextMenu.Freeze Property

The ContextMenu.Freeze property is a read-write Boolean property that gets or sets the appearance of the **Freeze** option on the shortcut menu.

#### Syntax

```
result = AlarmClient.ContextMenu.Freeze;
AlarmClient.ContextMenu.Freeze = FreezeVis;
```

#### Remarks

For more information, see Configuring the Run-Time Shortcut Menu.

### ContextMenu.Hidden Property

The ContextMenu.Hidden property is a read-write Boolean property that gets or sets the appearance of the **Hidden** option on the shortcut menu.

#### Syntax

```
result = AlarmClient.ContextMenu.Hidden;
AlarmClient.ContextMenu.Hidden = HiddenVis;
```

#### Remarks

For more information, see Configuring the Run-Time Shortcut Menu.

### ContextMenu.HideAll Property

The ContextMenu.HideAll property is a read-write Boolean property that gets or sets the appearance of the **Hide All** option on the shortcut menu.

#### Syntax

```
result = AlarmClient.ContextMenu.HideAll;
AlarmClient.ContextMenu.HideAll = HideAllVis;
```

#### Remarks

For more information, see Configuring the Run-Time Shortcut Menu.

### ContextMenu.HideOthers Property

The ContextMenu.HideOthers property is a read-write Boolean property that gets or sets the appearance of the **Hide Others** option on the shortcut menu.

#### Syntax

```
result = AlarmClient.ContextMenu.HideOthers;
AlarmClient.ContextMenu.HideOthers = HideOthersVis;
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Remarks

For more information, see Configuring the Run-Time Shortcut Menu.

## ContextMenu.HideSelected Property

The ContextMenu.HideSelected property is a read-write Boolean property that gets or sets the appearance of the **Hide Selected** option on the shortcut menu.

### Syntax

```
result = AlarmClient.ContextMenu.HideSelected;
AlarmClient.ContextMenu.HideSelected = HideSelVis;
```

### Remarks

For more information, see Configuring the Run-Time Shortcut Menu.

## ContextMenu.HideSelectedGroups Property

The ContextMenu.HideSelectedGroups property is a read-write Boolean property that gets or sets the appearance of the **Hide Selected Groups** option on the shortcut menu.

### Syntax

```
result = AlarmClient.ContextMenu.HideSelectedGroups;
AlarmClient.ContextMenu.HideSelectedGroups = HideSelGrpsVis;
```

### Remarks

For more information, see Configuring the Run-Time Shortcut Menu.

## ContextMenu.HideSelectedPriorities Property

The ContextMenu.HideSelectedPriorities property is a read-write Boolean property that gets or sets the appearance of the **Hide Selected Priorities** option on the shortcut menu.

### Syntax

```
result = AlarmClient.ContextMenu.HideSelectedPriorities;
AlarmClient.ContextMenu.HideSelectedPriorities = HideSelPrisVis;
```

### Remarks

For more information, see Configuring the Run-Time Shortcut Menu.

## ContextMenu.HideSelectedTags Property

The ContextMenu.HideSelectedTags property is a read-write Boolean property that gets or sets the appearance of the **Hide Selected Tags** option on the shortcut menu.

### Syntax

```
result = AlarmClient.ContextMenu.HideSelectedTags;
AlarmClient.ContextMenu.HideSelectedTags = HideSelTagsVis;
```

### Remarks

For more information, see Configuring the Run-Time Shortcut Menu.

## ContextMenu.HideVisible Property

The ContextMenu.HideVisible property is a read-write Boolean property that gets or sets the appearance of the **Hide Visible** option on the shortcut menu.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

**Syntax**

```
result = AlarmClient.ContextMenu.HideVisible;
AlarmClient.ContextMenu.HideVisible = HideVisVis;
```

**Remarks**

For more information, see Configuring the Run-Time Shortcut Menu.

### ContextMenu.Requery Property

The ContextMenu.Requery property is a read-write Boolean property that gets or sets the appearance of the **Requery** option on the shortcut menu.

**Syntax**

```
result = AlarmClient.ContextMenu.Requery;
AlarmClient.ContextMenu.Requery = RequeryVis;
```

**Remarks**

For more information, see Configuring the Run-Time Shortcut Menu.

### ContextMenu.Reset Property

The ContextMenu.Reset property is a read-write Boolean property that gets or sets the appearance of the **Reset** option on the shortcut menu.

**Syntax**

```
result = AlarmClient.ContextMenu.Reset;
AlarmClient.ContextMenu.Reset = ResetVis;
```

**Remarks**

For more information, see Configuring the Run-Time Shortcut Menu

### ContextMenu.ShelveAll Property

CntextMenu.ShelveAll is a read-write Boolean property that gets or sets the appearance of the **Shelve All** option on the Alarm Control's shortcut menu.

**Syntax**

```
To Set:
AlarmClient.ContextMenu.ShelveAll = boolean_value;
```

**Example**

```
AlarmClient1.ContextMenu.ShelveAll = true;
```

**Syntax**

```
To Get:
boolean_name = AlarmClient.ContextMenu.ShelveAll;
```

**Example**

```
dim ShlvAll as boolean;
ShlvAll = AlarmClient1.ContextMenu.ShelveAll;
```

**Remarks**

For more information, see Configuring the Run-Time Shortcut Menu.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### ContextMenu.ShelveOthers Property

ContextMenu.ShelveOthers is a read-write Boolean property that gets or sets the appearance of the **Shelve Others** option on the Alarm Control's shortcut menu.

**Syntax**

```
To Set:
AlarmClient.ContextMenu.ShelveOthers = boolean_value;
```

**Example**

```
AlarmClient1.ContextMenu.ShelveOthers = true;
```

**Syntax**

```
To Get:
boolean_name = AlarmClient.ContextMenu.ShelveOthers;
```

**Example**

```
dim ShlvOthrs as boolean;
ShlvOthrs = AlarmClient1.ContextMenu.ShelveOthers;
```

**Remarks**

For more information, see Configuring the Run-Time Shortcut Menu.

### ContextMenu.ShelveSelected Property

ContextMenu.ShelveSelected is a read-write Boolean property that gets or sets the appearance of the **Shelve Selected** option on the Alarm Control's shortcut menu.

**Syntax**

```
To Set:
AlarmClient.ContextMenu.ShelveSelected = boolean_value;
```

**Example**

```
AlarmClient1.ContextMenu.ShelveSelected = true;
```

**Syntax**

```
To Get:
boolean_name = AlarmClient.ContextMenu.ShelveSelected;
```

**Example**

```
dim ShlvSlctd as boolean;
ShlvSlctd = AlarmClient1.ContextMenu.ShelveSelected;
```

**Remarks**

For more information, see Configuring the Run-Time Shortcut Menu.

### ContextMenu.ShelveSelectedGroups Property

ContextMenu.ShelveSelectedGroups is a read-write Boolean property that gets or sets the appearance of the **Shelve Selected Groups** option on the Alarm Control's shortcut menu.

**Syntax**

```
To Set:
AlarmClient.ContextMenu.ShelveSelectedGroups = boolean_value;
```

**Example**

```
AlarmClient1.ContextMenu.ShelveSelectedGroups = true;
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

**Syntax**

```
To Get:
boolean_name = AlarmClient.ContextMenu.ShelveSelectedGroups;
```

**Example**

```
dim ShlvSlctdGrp as boolean;
ShlvSlctdGrp = AlarmClient1.ContextMenu.ShelveSelectedGroups;
```

**Remarks**

For more information, see Configuring the Run-Time Shortcut Menu.

### ContextMenu.ShelveSelectedPriorities Property

ContextMenu.ShelveSelectedPriorities is a read-write Boolean property that gets or sets the appearance of the **Shelve Selected Priorities** option on the Alarm Control's shortcut menu.

**Syntax**

```
To Set:
AlarmClient.ContextMenu.ShelveSelectedPriorities = boolean_value;
```

**Example**

```
AlarmClient1.ContextMenu.ShelveSelectedPriorities = true;
```

**Syntax**

```
To Get:
boolean_name = AlarmClient.ContextMenu.ShelveSelectedPriorities;
```

**Example**

```
dim ShlvSlctdPri as boolean;
ShlvSlctdPri = AlarmClient1.ContextMenu.ShelveSelectedPriorities;
```

**Remarks**

For more information, see Configuring the Run-Time Shortcut Menu.

### ContextMenu.ShelveSelectedSeverities Property

ContextMenu.ShelveSelectedSeverities is a read-write Boolean property that gets or sets the appearance of the **Shelve Selected Severities** option on the Alarm Control's shortcut menu.

**Syntax**

```
To Set:
AlarmClient.ContextMenu.ShelveSelectedSeverities = boolean_value;
```

**Example**

```
AlarmClient1.ContextMenu.ShelveSelectedSeverities = true;
```

**Syntax**

```
To Get:
boolean_name = AlarmClient.ContextMenu.ShelveSelectedSeverities;
```

**Example**

```
dim ShlvSlctdSev as boolean;
ShlvSlctdSev = AlarmClient1.ContextMenu.ShelveSelectedSeverities;
```

**Remarks**

For more information, see Configuring the Run-Time Shortcut Menu.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### ContextMenu.ShelveSelectedTags Property

ContextMenu.ShelveSelectedTags is a read-write Boolean property that gets or sets the appearance of the **Shelve Selected Tags** option on the Alarm Control's shortcut menu.

**Syntax**

```
To Set:
AlarmClient.ContextMenu.ShelveSelectedTags = boolean_value;
```

**Example**

```
AlarmClient1.ContextMenu.ShelveSelectedTags = true;
```

**Syntax**

```
To Get:
boolean_name = AlarmClient.ContextMenu.ShelveSelectedTags;
```

**Example**

```
dim ShlvSlctdTag as boolean;
ShlvSlctdTag = AlarmClient1.ContextMenu.ShelveSelectedTags;
```

**Remarks**

For more information, see Configuring the Run-Time Shortcut Menu

### ContextMenu.ShelveVisible Property

ContextMenu.ShelveVisible is a read-write Boolean property that gets or sets the appearance of the **Shelve Visible** option appears in the Alarm Control's shortcut menu.

**Syntax**

```
To Set:
AlarmClient.ContextMenu.ShelveSelectedVisible = boolean_value;
```

**Example**

```
AlarmClient1.ContextMenu.ShelveSelectedVisible = true;
```

**Syntax**

```
To Get:
boolean_name = AlarmClient.ContextMenu.ShelveSelectedVisible;
```

**Example**

```
dim ShlvSlctdVis as boolean;
ShlvSlctdVis = AlarmClient1.ContextMenu.ShelveSelectedVisible;
```

**Remarks**

For more information, see Configuring the Run-Time Shortcut Menu

### ContextMenu.Sort Property

The ContextMenu.Sort property is a read-write Boolean property that gets or sets the appearance of the **Sort** option on the shortcut menu.

**Syntax**

```
result = AlarmClient.ContextMenu.Sort;
AlarmClient.ContextMenu.Sort = SortVis;
```

**Remarks**

For more information, see Configuring the Run-Time Shortcut Menu

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### ContextMenu.Statistics Property

The ContextMenu.Statistics property is a read-write Boolean property that gets or sets the appearance of the **Statistics** option on the shortcut menu.

#### Syntax

```
result = AlarmClient.ContextMenu.Statistics;
AlarmClient.ContextMenu.Statistics = StatsVis;
```

#### Remarks

For more information, see Configuring the Run-Time Shortcut Menu

### ContextMenu.UnhideAll Property

The ContextMenu.UnhideAll property is a read-write Boolean property that gets or sets the appearance of the **Unhide All** option on the shortcut menu.

#### Syntax

```
result = AlarmClient.ContextMenu.UnhideAll;
AlarmClient.ContextMenu.UnhideAll = UnhideAllVis;
```

#### Remarks

For more information, see Configuring the Run-Time Shortcut Menu.

### ContextMenu.UnshelveAll Property

ContextMenu.UnshelveAll is read-write Boolean property that gets or sets the appearance of the **Unshelve All** option on the Alarm Control's shortcut menu.

#### Syntax

```
To Set:
AlarmClient.ContextMenu.UnshelveAll = boolean_value;
```

#### Example

```
AlarmClient1.ContextMenu.UnshelveAll = true;
```

#### Syntax

```
To Get:
boolean_variable_name = AlarmClient.ContextMenu.UnshelveAll;
```

#### Example

```
dim ShlvAll as boolean;
ShlvAll = AlarmClient1.ContextMenu.UnshelveAll;
```

#### Remarks

For more information, see Configuring the Run-Time Shortcut Menu.

### ContextMenu.UnshelveOthers Property

ContextMenu.UnshelveOthers is read-write Boolean property that gets or sets the appearance of the **Unshelve Others** option on the Alarm Control's shortcut menu.

#### Syntax

```
To Set:
AlarmClient.ContextMenu.UnshelveOthers = boolean_value;
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

**Example**

```
AlarmClient1.ContextMenu.UnshelveOthers = true;
```

**Syntax**

```
To Get:
boolean_variable_name = AlarmClient.ContextMenu.UnshelveOthers;
```

**Example**

```
dim ShlvOthrs as boolean;
ShlvOthrs = AlarmClient1.ContextMenu.UnshelveOthers;
```

**Remarks**

For more information, see Configuring the Run-Time Shortcut Menu.

### ContextMenu.UnshelveSelected Property

ContextMenu.UnshelveSelected is read-write Boolean property that gets or sets the appearance of the **Unshelve Selected** option on the Alarm Control's shortcut menu.

**Syntax**

```
To Set:
AlarmClient.ContextMenu.UnshelveSelected = boolean_value;
```

**Example**

```
AlarmClient1.ContextMenu.UnshelveSelected = true;
```

**Syntax**

```
To Get:
boolean_variable_name = AlarmClient.ContextMenu.UnshelveSelected;
```

**Example**

```
dim ShlvSlctd as boolean;
ShlvSlctd = AlarmClient1.ContextMenu.UnshelveSelected;
```

**Remarks**

For more information, see Configuring the Run-Time Shortcut Menu

### ContextMenu.UnshelveSelectedGroups Property

ContextMenu.UnshelveSelectedGroups is read-write Boolean property that gets or sets the appearance of the **Unshelve Selected Groups** option on the Alarm Control's shortcut menu.

**Syntax**

```
To Set:
AlarmClient.ContextMenu.UnshelveSelectedGroups = boolean_value;
```

**Example**

```
AlarmClient1.ContextMenu.UnshelveSelectedGroups = true;
```

**Syntax**

```
To Get:
boolean_name = AlarmClient.ContextMenu.UnshelveSelectedGroups;
```

**Example**

```
dim UnshlvSlctdGrp as boolean;
UnshlvSlctdGrp = AlarmClient1.ContextMenu.UnshelveSelectedGroups;
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Remarks

For more information, see Configuring the Run-Time Shortcut Menu

## ContextMenu.UnshelveSelectedPriorities Property

ContextMenu.UnshelveSelectedPriorities is read-write Boolean property that gets or sets the appearance of the **Unshelve Selected Priorities** option on the Alarm Control's shortcut menu.

### Syntax

```
To Set:
AlarmClient.ContextMenu.UnshelveSelectedPriorities = boolean_value;
```

### Example

```
AlarmClient1.ContextMenu.UnshelveSelectedPriorities = true;
```

### Syntax

```
To Get:
boolean_name = AlarmClient.ContextMenu.UnshelveSelectedPriorities;
```

### Example

```
dim UnshlvSlctdPri as boolean;
UnshlvSlctdPri = AlarmClient1.ContextMenu.UnshelveSelectedPriorities;
```

### Remarks

For more information, see Configuring the Run-Time Shortcut Menu

## ContextMenu.UnshelveSelectedSeverities Property

ContextMenu.UnshelveSelectedSeverities is read-write Boolean property that gets or sets the appearance of the **Unshelve Selected Severities** option on the Alarm Control's shortcut menu.

### Syntax

```
To Set:
AlarmClient.ContextMenu.UnshelveSelectedSeverities = boolean_value;
```

### Example

```
AlarmClient1.ContextMenu.UnshelveSelectedSeverities = true;
```

### Syntax

```
To Get:
boolean_name = AlarmClient.ContextMenu.UnshelveSelectedSeverities;
```

### Example

```
dim UnshlvSlctdSev as boolean;
UnshlvSlctdSev = AlarmClient1.ContextMenu.UnshelveSelectedSeverities;
```

### Remarks

For more information, see Configuring the Run-Time Shortcut Menu

## ContextMenu.UnshelveSelectedTags Property

ContextMenu.UnshelveSelectedTags is read-write Boolean property that gets or sets the appearance of the **Unshelve Selected Tags** option on the Alarm Control's shortcut menu.

### Syntax

```
To Set:
AlarmClient.ContextMenu.UnshelveSelectedTags = boolean_value;
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

**Example**

```
AlarmClient1.ContextMenu.UnshelveSelectedTags = true;
```

**Syntax**

```
To Get:
boolean_name = AlarmClient.ContextMenu.UnshelveSelectedTags;
```

**Example**

```
dim UnshlvSlctdTag as boolean;
UnshlvSlctdTag = AlarmClient1.ContextMenu.UnshelveSelectedTags;
```

**Remarks**

For more information, see Configuring the Run-Time Shortcut Menu

### ContextMenu.UnshelveVisible Property

ContextMenu.UnshelveVisible is read-write Boolean property that gets or sets the appearance of the **Unshelve Visible** option on the Alarm Control's shortcut menu.

**Syntax**

```
To Set:
AlarmClient.ContextMenu.UnshelveSelectedVisible = boolean_value;
```

**Example**

```
AlarmClient1.ContextMenu.UnshelveSelectedVisible = true;
```

**Syntax**

```
To Get:
boolean_name = AlarmClient.ContextMenu.UnshelveSelectedVisible;
```

**Example**

```
dim UnshlvSlctdVis as boolean;
UnshlvSlctdVis = AlarmClient1.ContextMenu.UnshelveSelectedVisible;
```

**Remarks**

For more information, see Configuring the Run-Time Shortcut Menu

### Database.Authentication Property

The Database.Authentication property is a read-write string property that gets or sets the authentication mode to connect to the Alarm Database. Possible values are:

- Windows Integrated
- Windows Account
- SQL Server

The default value is "Windows Integrated".

**Syntax**

```
result = AlarmClient.Database.Authentication;
AlarmClient.Database.Authentication = AuthMode;
```

**Example**

```
AlarmClient.Database.Authentication = "Windows Integrated";
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Remarks

For more information, see Showing Historical Alarms and/or Events.

## Database.Name Property

The Database.Name property is a read-write string property that gets or sets the name of the Alarm Database. The default value is "WWALMDB". WWALMDB is the name of the InTouch Database and A2ALMDB is the name of the ArchestrA Database.

If you change the Database.Name property at run time, you need to call the Connect method to connect to the new alarm database.

### Syntax

```
result = AlarmClient.Database.Name;
AlarmClient.Database.Name = AlmDBName;
```

### Remarks

For more information, see Showing Historical Alarms and/or Events.

## Database.Password Property

The Database.Password property is a read-write string property that gets or sets the password associated with the user name to connect to the Alarm Database.

### Syntax

```
result = AlarmClient.Database.Password;
AlarmClient.Database.Password = Psswrd;
```

### Remarks

For more information, see Showing Historical Alarms and/or Events

## Database.ServerName Property

The Database.ServerName property is a read-write string property that gets or sets the name of the server that hosts the Alarm Database.

### Syntax

```
result = AlarmClient.Database.ServerName;
AlarmClient.Database.ServerName = SrvName;
```

### Remarks

For more information, see Showing Historical Alarms and/or Events.

## Database.UserID Property

The Database.UserID property is a read-write string property that gets or sets the name of user authorized to access the Alarm Database.

### Syntax

```
result = AlarmClient.Database.UserID;
AlarmClient.Database.UserID = UserName;
```

### Remarks

For more information, see Showing Historical Alarms and/or Events.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### DisableFileBrowsing Property

Specify **True** to get/set the option to access the file browser when importing or exporting files.

#### Syntax

```
result = AlarmClient.DisableFileBrowsing;
AlarmClient.DisableFileBrowsing = boolean_value;
```

#### Example

```
AlarmClient.DisableFileBrowsing = true;
```

#### Remarks

Default is **True**.

### Domain Property

The Domain property is a read-write string property that gets or sets the domain name of the user to connect to the Alarm Database.

#### Syntax

```
result = AlarmClient.Domain;
AlarmClient.Domain = DomName;
```

#### Remarks

For more information, see Showing Historical Alarms and/or Events.

### Enabled Property

The Enabled property is a read-write Boolean property that gets or sets the enablement of Alarm Control. When the Alarm Control is disabled, alarm records are still updated, but the operator cannot interact with the control.

The operator can still use scripting to interact with the control.

#### Syntax

```
result = AlarmClient.Enabled;
AlarmClient.Enabled = EnableFlag;
```

### EventColor.BackGround Property

The EventColor.BackGround property is a read-write color property that gets or sets the background color of event records.

#### Syntax

```
Color = AlarmClient.EventColor.BackGround;
AlarmClient.EventColor.BackGround = Color;
```

#### Parameters

*Color*
Color of background.

#### Example

```
AlarmClient1.EventColor.BackGround = Color.Blue;
```

#### Remarks

Color is a .NET Framework data type. You can use various Color methods to set the color, such as a predefined color name, FromARGB(), FromKnownColor(), and FromName().

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

For a list of the .NET color names and the hexadecimal codes, see .NET Colors.

For more information on the color methods, see the online Microsoft documentation for .NET Framework Development.

### EventColor.ForeGround Property

The EventColor.ForeGround property is a read-write color property that gets or sets the text color of event records.

#### Syntax

```
Color = AlarmClient.EventColor.ForeGround;
AlarmClient.EventColor.ForeGround = Color;
```

#### Parameters

*Color*
Color of text.

#### Example

```
AlarmClient1.EventColor.ForeGround = Color.Blue;
```

#### Remarks

Color is a .NET Framework data type. You can use various Color methods to set the color, such as a predefined color name, FromARGB(), FromKnownColor(), and FromName().

For a list of the .NET color names and the hexadecimal codes, see .NET Colors.

For more information on the color methods, see the online Microsoft documentation for .NET Framework Development.

### Favorite Property

The Favorite property is a read-write string property that gets or sets the name of the current query filter favorite.

#### Syntax

```
QueryFilterName = AlarmClient.Favorite;
AlarmClient.Favorite = QueryFilterName;
```

#### Parameters

*QueryFilterName*
The name of a query filter favorite.

#### Example

The following example sets the current Alarm Control grid to the Query Filter Favorite with the name "All Hi Priority Alarms".

```
AlarmClient1.Favorite = "All Hi Priority Alarms";
```

#### Remarks

You can also use this property to reset the currently used query filter to its default with the following script:

```
AlarmClient.Favorite = "Default";
```

The Favorite property executes as a query to retain previous release default behavior. If you want to execute the query/filter as a filter only, then use the RunQuery() method.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### FlashUnAckAlarms Property

The FlashUnAckAlarms property is a read-write Boolean property that gets or sets the flashing of unacknowledged alarm records.

#### Syntax

```
result = AlarmClient.FlashUnAckAlarms;
AlarmClient.FlashUnAckAlarms = FlashUnAckRecs;
```

#### Remarks

For more information, see Set Unacknowledged Alarms to Flash.

### GridColor Property

The GridColor property is a read-write color property that gets or sets the color of the grid lines.

#### Syntax

```
Color = AlarmClient.GridColor;
AlarmClient.GridColor = Color;
```

#### Parameters

*Color*
Color of the grid lines.

#### Example

```
AlarmClient1.GridColor = Color.Black;
```

#### Remarks

For more information, see Setting Heading, Grid, and Window Color.

Color is a .NET Framework data type. You can use various Color methods to set the color, such as a predefined color name, FromARGB(), FromKnownColor(), and FromName().

For a list of the .NET color names and the hexadecimal codes, see .NET Colors.

For more information on the color methods, see the online Microsoft documentation for .NET Framework Development.

### HeadingColor.BackGround Property

The HeadingColor.BackGround property is a read-write color property that gets or sets the background color of the heading.

#### Syntax

```
Color = AlarmClient.HeadingColor.BackGround;
AlarmClient.HeadingColor.BackGround = Color;
```

#### Parameters

*Color*
Color of background.

#### Example

```
AlarmClient1.HeadingColor.BackGround = Color.Blue;
```

#### Remarks

For more information, see Setting Heading, Grid, and Window Color.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

Color is a .NET Framework data type. You can use various Color methods to set the color, such as a predefined color name, FromARGB(), FromKnownColor(), and FromName().

For a list of the .NET color names and the hexadecimal codes, see .NET Colors.

For more information on the color methods, see the online Microsoft documentation for .NET Framework Development.

### HeadingColor.ForeGround Property

The HeadingColor.ForeGround property is a read-write color property that gets or sets the text color of the heading.

#### Syntax

```
Color = AlarmClient.HeadingColor.ForeGround;
AlarmClient.HeadingColor.ForeGround = Color;
```

#### Parameters

*Color*
Color of text.

#### Example

```
AlarmClient1.HeadingColor.ForeGround = Color.Blue;
```

#### Remarks

For more information, see Setting Heading, Grid, and Window ColorSetting Heading, Grid, and Window Color.

Color is a .NET Framework data type. You can use various Color methods to set the color, such as a predefined color name, FromARGB(), FromKnownColor(), and FromName().

For a list of the .NET color names and the hexadecimal codes, see .NET Colors.

For more information on the color methods, see the online Microsoft documentation for .NET Framework Development.

### Height Property

The Height property is a read-write integer property that gets or sets the height of the Alarm Control in pixels.

#### Syntax

```
result = AlarmClient.Height;
AlarmClient.Height = Hght;
```

### HiddenAlarms Property

The HiddenAlarms property is a read-only integer property that gets the number of hidden alarms.

#### Syntax

```
Result = AlarmClient.HiddenAlarms;
```

#### Example

```
LogMessage("There are " + Text(AlarmClient1.HiddenAlarms,"#")+" hidden alarms.");
```

### HideErrors Property

The HideErrors property is a read-write Boolean property that gets or sets the Hide Errors option.

- TRUE - Run-time errors, warnings, and status messages are written to the ArchestrA Logger. No pop-ups appear

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- FALSE - Run-time errors, warnings, and status messages pop-up and are also written to the ArchestrA Logger

**Syntax**

```
result = AlarmClient.HideErrors;
AlarmClient.HideErrors = SilentMode;
```

**Remarks**

For more information, see Hide Errors, Warnings, and Status Messages.

### IsFrozen Property

The IsFrozen property is a read-only Boolean property that can be used to identify whether the alarm client control is in a Frozen mode.

When the value is True, the control is frozen, else the control is not frozen.

**Remarks**

For more information, see Freeze and Unfreeze the Alarm Control Grid.

**Example**

```
Dim FR as boolean;
FR = AlarmClient1.IsFrozen;
```

### MaxDatabaseRecords Property

The MaxDatabaseRecords property is a read-write integer property that gets or sets the maximum records retrieved from the database that will appear in each page of the Alarm Control Client at one instance. The valid range is 1 to 32766.

**Syntax**

```
result = AlarmClient.MaxDatabaseRecords;
AlarmClient.MaxDatabaseRecords = MaxRecs;
```

**Remarks**

This property is for Historical Alarms, Historical Events, or Historical Alarms and Events modes. For more information, see Showing Historical Alarms and/or Events.

### MaxTotalRetrievalCount Property

The MaxTotalRetrievalCount property is a read-write integer property that gets or sets the maximum total number of records that will be retrieved from the database.

**Syntax**

```
result = AlarmClient.MaxTotalRetrievalCount;
AlarmClient.MaxTotalRetrievalCount = MaxRecs;
```

**Remarks**

This property is for Historical Alarms, Historical Events, or Historical Alarms and Events modes. If the property is set to a positive integer, in historical mode Alarm Client Control will retrieve up to MaxTotalRetrievalCount of alarm records. For example, there are 1000 alarm records in the database. If Set MaxTotalRetrievalCount = 500, then only top 500 alarm records will be returned. If Set MaxTotalRetrievalCount = 2000, then all 1000 alarm records will be returned.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### NewAlarmEventMode Property

The NewAlarmEventMode property is an read-write integer property that gets or sets the trigger behavior of the New Alarm event.

#### Syntax

```
EMode = AlarmClient.NewAlarmEventMode;
AlarmClient.NewAlarmEventMode = EMode;
```

#### Parameters

EMode

Event mode with following possible values:

| Value | Description |
|---|---|
| 0 | The NewAlarm event cannot be triggered. (default). |
| 1 | The NewAlarm event is triggered only one time the first time a new alarm occurs. |
| 2 | The NewAlarm event is triggered every time a new alarm occurs. |

### NoRecordsMessage.Enabled Property

The NoRecordsMessage.Enabled property is a read-write Boolean property that gets or sets the visibility of a custom message when no alarm records are available.

#### Syntax

```
result = AlarmClient.NoRecordsMessage.Enabled;
AlarmClient.NoRecordsMessage.Enabled = showMessage;
```

#### Example

```
AlarmClient1.NoRecordsMessage.Enabled = 1;
AlarmClient1.NoRecordsMessage.Message = "There are no alarm records available";
```

#### Remarks

Use this property in combination with the NoRecordsMessage.Message property.

### NoRecordsMessage.Message Property

The NoRecordsMessage.Message property is a read-write string property that gets or sets the custom message text when no alarm records are available and the **NoRecordsMessage.Enabled** property value is TRUE.

#### Syntax

```
result = AlarmClient.NoRecordsMessage.Message;
AlarmClient.NoRecordsMessage.Message = myCustomMessage;
```

#### Example

```
AlarmClient1.NoRecordsMessage.Enabled = 1;
AlarmClient1.NoRecordsMessage.Message = "There are no alarm records available";
```

#### Remarks

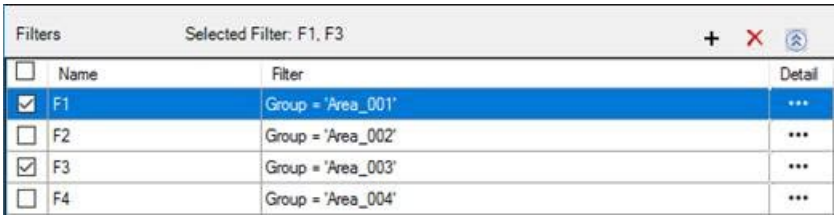
Use this property in combination with the NoRecordsMessage.Enabled property.

### QueryFilters.SelectedFilters Property

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

The QueryFilters.SelectedFilters property is a read-only String property used to get the filter selecting status.

For example, an alarm client control with the following filters selected, the QueryFilters.SelectedFilters property will return value of “F1, F3”.




In the property, each filter will be separated using a comma ‘,’.

**Example**

```
Dim SF as string;
```

SF = AlarmClient1.QueryFilters.SelectedFilters;

### QueryStartup Property

The QueryStartup property is a read-write Boolean property that gets or sets or sets the automatic update of the Alarm Control on startup.

**Syntax**

```
result = AlarmClient.QueryStartup;
AlarmClient.QueryStartup = AutoQry;
```

**Remarks**

For more information, see Automatic Query for Alarms on Start Up.

### RequiresShelveSignature Property

The RequiresShelveSignature property is a read-write Boolean property to specify if a user signature is required to shelve an alarm.

**Syntax**

```
To Set:
AlarmClient.RequiresShelveSignature = boolean_value;
```

**Example**

```
AlarmClient1.RequiresShelveSignature = true;
```

**Syntax**

```
To Get:
boolean_variable_name> = AlarmClient.RequiresShelveSignature;
```

**Example**

```
dim bIsShlvSigned as boolean;
bIsShlvSigned = AlarmClient1.RequiresShelveSignature;
```

**Remarks**

For more information, see Configuring the Alarm Control to Require a SHELVE Signature.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### RetainHidden Property

The RetainHidden property is a read-write Boolean property that gets or sets the retention of hidden alarms or events when the alarm query or query filter to retrieve records changes at run time.

#### Syntax

```
result = AlarmClient.RetainHidden;
AlarmClient.RetainHidden = RetainHddn;
```

#### Remarks

For more information, see Retain Hiding when Changing Alarm Query Filter.

### RowCount Property

The RowCount property is a read-only integer property that gets the number of records shown in the Alarm Control grid.

For current alarms (and recent alarms and events), the **RowCount** property value is always the same as the **TotalRowCount** property value.

For historical alarms, if the Alarm Control retrieves more alarm records than specified by the **MaxDatabaseRecords** property value, it splits these into multiple pages.

The **RowCount** property shows how many alarm records are currently shown on the current page. The RowCount property value is the same as the **MaxDatabaseRecords** property value, with exception of the last page.

#### Syntax

```
Result = AlarmClient.RowCount;
```

#### Example

```
NRows = AlarmClient1.RowCount;
LogMessage("There are " + Text(NRows, "#") + " alarm records on the retrieved page.");
```

### RowSelection Property

The RowSelection property is a read-write string property that determines if row selection is allowed at run time. The following values are possible:

| Value | Description |
|---|---|
| No | Operator cannot select rows. |
| Single | Operator can only select one row at a time. |
| Multiple | Operator can select one or more rows. |

The default value is "Multiple".

#### Syntax

```
Result = AlarmClient.RowSelection;
AlarmClient.RowSelection = RwSel;
```

#### Example

```
AlarmClient1.RowSelection = "Multiple";
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Remarks

For more information, see Restrict User Access to Rows and Columns.

## SaveUserQueryFilter Property

Gets/Sets the option to save runtime user queries and filters. If false, then user modified queries or filters will not be saved to file. If true, user modification will be saved to file.

### Syntax

```
result = AlarmClient.SaveUserQueryFilter;
AlarmClient.SaveUserQueryFilter = boolean_true;
```

### Example

```
AlarmClient.SaveUserQueryFilter = true;
```

### Remarks

Default is **True**.

## SelectedCount Property

The SelectedCount property is a read-only integer property that gets the total number of selected alarm records.

### Syntax

```
Result = AlarmClient.SelectedCount;
```

### Return Value

Returns the number of selected alarm records.

### Example

```
NSelRows = AlarmClient1.SelectedCount;
If NSelRows > 5 Then
   LogMessage("There are more than 5 rows selected.");
Endif;
```

## ShelveColor.BackGround Property

ShelveColor.BackGround is an integer property to set the background color of shelved alarm records in the Alarm Control.

### Syntax

```
Color= AlarmClient.ShelveColor.Background;
AlarmClient.ShelveColor.BackGround = Color
```

### Parameters

*Color*
Background color of a shelved alarm record.

### Example

```
AlarmClient1.ShelveColor.BackGround = Color.FromARGB(255,0,128);
```

### Remarks

For more information, see Setting Heading, Grid, and Window Color.

Color is a .NET Framework data type. You can use various Color methods to set the color, such as a predefined color name, FromARGB(), FromKnownColor(), and FromName().

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

For a list of the .NET color names and the hexadecimal codes, see .NET Colors.

For more information on the color methods, see the online Microsoft documentation for .NET Framework Development.

### ShelveColor.ForeGround Property

ShelveColor.ForeGround is an integer property to set the foreground or text color of shelved alarm records in the Alarm Control.

#### Syntax

```
Color= AlarmClient.ShelveColor.Foreground;
AlarmClient.ShelveColor.Foreground = Color
```

#### Parameters

*Color*
Foreground color of a shelved alarm record.

#### Example

```
AlarmClient1.ShelveColor.Foreground = Color.FromARGB(255,255,255);
```

#### Remarks

For more information, see Setting Heading, Grid, and Window Color.

Color is a .NET Framework data type. You can use various Color methods to set the color, such as a predefined color name, FromARGB(), FromKnownColor(), and FromName().

For a list of the .NET color names and the hexadecimal codes, see .NET Colors.

For more information on the color methods, see the online Microsoft documentation for .NET Framework Development.

### ShowContextMenu Property

The ShowContextMenu property is a read-write Boolean property that gets or sets the ability to open the shortcut menu at run time.

#### Syntax

```
result = AlarmClient.ShowContextMenu;
AlarmClient.ShowContextMenu = ContxtMnuAvail;
```

### ShowGrid Property

The ShowGrid property is a read-write Boolean property that gets or sets the appearance of grid lines.

#### Syntax

```
result = AlarmClient.ShowGrid;
AlarmClient.ShowGrid = showGrid;
```

### ShowGroupByHeader Property

The ShowGroupByHeader property is a read-write Boolean property to show or hide the column grouping label at the top of the run-time Alarm Control in the historical mode. Set the ShowGroupByHeader property to true to show the label "Drag a column header here to group by that column".

#### Syntax

```
result = AlarmClient.ShowGroupByHeader;
AlarmClient.ShowGroupByHeader = ShowGroupByHeader;
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### ShowHeading Property

The ShowHeading property is a read-write Boolean property that gets or sets the visibility of the grid heading at run time.

**Syntax**

```
result = AlarmClient.ShowHeading;
AlarmClient.ShowHeading = showHeading;
```

### ShowStatusBar Property

The ShowStatusBar property is a read-write Boolean property that gets or sets the visibility of the status bar at run time.

**Syntax**

```
result = AlarmClient.ShowStatusBar;
AlarmClient.ShowStatusBar = showStatusBar;
```

### SortColumn.First Property

The SortColumn.First property is a read-write string property that gets or sets the first sort column.

The default value is "Time (LCT)".

**Syntax**

```
result = AlarmClient.SortColumn.First;
AlarmClient.SortColumn.First = sortByFirst;
```

**Example**

```
AlarmClient1.SortColumn.First = "Class";
```

**Remarks**

Use this property in connection with the SortOrder.First to determine the sorting direction.

### SortColumn.Second Property

The SortColumn.Second property is a read-write string property that gets or sets the second sort column.

The default value is blank.

**Syntax**

```
result = AlarmClient.SortColumn.Second;
AlarmClient.SortColumn.Second = sortBySecond;
```

**Example**

```
AlarmClient1.SortColumn.Second = "Type";
```

**Remarks**

Use this property in connection with the SortOrder.Second to determine the sorting direction.

### SortColumn.Third Property

The SortColumn.Third property is a read-write string property that gets or sets the third sort column.

The default value is blank.

**Syntax**

```
result = AlarmClient.SortColumn.Third;
AlarmClient.SortColumn.Third = sortByThird;
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Example

```
AlarmClient1.SortColumn.Third = "State";
```

### Remarks

Use this property in connection with the SortOrder.Third to determine the sorting direction.

## SortColumn.Fourth Property

The SortColumn.Fourth property is a read-write string property that gets or sets the fourth sort column.

The default value is blank.

### Syntax

```
result = AlarmClient.SortColumn.Fourth;
AlarmClient.SortColumn.Fourth = sortByFourth;
```

### Example

```
AlarmClient1.SortColumn.Fourth = "Priority";
```

### Remarks

Use this property in connection with the SortOrder.Fourth to determine the sorting direction.

## SortOrder.First Property

The SortOrder.First property is a read-write Boolean property that gets or sets the sorting direction of the first sort column. The following values are possible:

| Value | Description |
|---|---|
| FALSE | Ascending sorting direction |
| TRUE | Descending sorting direction |

The default value is FALSE (Ascending).

### Syntax

```
result = AlarmClient.SortOrder.First;
AlarmClient.SortOrder.First = sortDirFirst;
```

### Remarks

Use this property in connection with the SortColumn.First to determine which column is sorted.

## SortOrder.Second Property

The SortOrder.Second property is a read-write Boolean property that gets or sets the sorting direction of the second sort column. The following values are possible:

| Value | Description |
|---|---|
| FALSE | Ascending sorting direction |
| TRUE | Descending sorting direction |

The default value is FALSE (Ascending).

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

**Syntax**

```
result = AlarmClient.SortOrder.Second;
AlarmClient.SortOrder.Second = sortDirSecond;
```

**Remarks**

Use this property in connection with the SortColumn.Second to determine which column is sorted.

### SortOrder.Third Property

The SortOrder.Third property is a read-write Boolean property that gets or sets the sorting direction of the third sort column. The following values are possible:

| Value | Description |
|---|---|
| FALSE | Ascending sorting direction |
| TRUE | Descending sorting direction |

The default value is FALSE (Ascending).

**Syntax**

```
result = AlarmClient.SortOrder.Third;
AlarmClient.SortOrder.Third = sortDirThird;
```

**Remarks**

Use this property in connection with the SortColumn.Third to determine which column is sorted.

### SortOrder.Fourth Property

The SortOrder.Fourth property is a read-write Boolean property that gets or sets the sorting direction of the fourth sort column. The following values are possible:

| Value | Description |
|---|---|
| FALSE | Ascending sorting direction |
| TRUE | Descending sorting direction |

The default value is FALSE (Ascending).

**Syntax**

```
result = AlarmClient.SortOrder.Fourth;
AlarmClient.SortOrder.Fourth = sortDirFourth;
```

**Remarks**

Use this property in connection with the SortColumn.Fourth to determine which column is sorted.

### Time.Format Property

The Time.Format property is a read-write string property that gets or sets the date and time formats of the alarm records in the Alarm Control.

You can either use the .NET time format or the default format. Set the Time.Type property to determine which time format type to use.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Syntax

```
result = AlarmClient.Time.Format;
AlarmClient.Time.Format = TmFormat;
```

### Example

This example shows the time format in French format (day/month/year) using the .NET datetime type.

```
AlarmClient1.Time.Type = 1;
AlarmClient1.Time.Format = "dd/MM/yyyy";
```

### Remarks

For more information about the .NET time format, see Set a .NET DateTime Format.

For more information about the default time format, see Set a Time Format.

## Time.Type Property

The Time.Type property is a read-write Boolean property that gets or sets the time format type of the alarm records. The following values are possible:

| Value | Description |
|---|---|
| FALSE | Default time format |
| TRUE | .NET time format (default) |

### Syntax

```
result = AlarmClient.Time.Type;
AlarmClient.Time.Type = TmType;
```

### Example

This example shows the time format in German format (day.month.year) using the default datetime type.

```
AlarmClient1.Time.Type = 0;
AlarmClient1.Time.Format = "%d.%m.%Y %H:%M:%S";
```

### Remarks

For more information about the .NET time format, see Set a .NET DateTime Format.

For more information about the default time format, see Set a Time Format.

## TimeSelector Property

The TimeSelector property gets the Time Range Picker object used in the Alarm Control. You can use it in scripting to shorten the code using its properties and methods.

For the individual properties and methods, see the following properties, or the methods starting at TimeSelector.SetStartAndEndTimes() Method.

### Example 1

```
dim TRP as object;
TRP = AlarmClient1.TimeSelector;
Timeselect = TRP;
StartDate = TRP.StartDate;
EndDate = TRP.EndDate;
duration = TRP.TimeDuration;
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

**Example 2**

```
dim TRP as object;
TRP = AlarmClient1.TimeSelector;
TRP.SetStartAndEndTimes(StartDate, EndDate, Duration);
```

### TimeSelector.DurationMS Property

The TimeSelector.DurationMS property is a read-write integer property that gets the time duration measured in milliseconds.

The start time of the Alarm control (TimeSelector.StartDate) is calculated as the end time (TimeSelector.EndDate) minus the new time duration (TimeSelector.DurationMS).

When you set the value of the TimeSelector.DurationMS property, the TimeSelector.TimeDuration property is set to 0.

The default value is 3600000.

**Syntax**

```
result = AlarmClient.TimeSelector.DurationMS;
AlarmClient.TimeSelector.DurationMS = Value;
```

**Example**

```
AlarmClient1.TimeSelector.DurationMS = 1800000;
// The Alarm Control now retrieves alarms from the last 30 minutes.
```

### TimeSelector.EndDate Property

The TimeSelector.EndDate property is a read-only string property that gets the end date and time of the Alarm Control.

The default value is the time the Alarm Control is placed on the canvas. If the **Update to Current Time** option is enabled, the TimeSelector.EndDate property is updated with the current time.

**Note**: To set the end date and time of the Alarm Control, use the TimeSelector.SetStartAndEndTimes() Method.

**Syntax**

```
result = AlarmClient.TimeSelector.EndDate;
```

**Example**

```
LogMessage(AlarmClient1.TimeSelector.EndDate);
```

### TimeSelector.StartDate Property

The TimeSelector.StartDate property is a read-only string property that gets the start date and time of the Alarm Control.

The default value is the time the Alarm Control is placed on the canvas. If the **Update to Current Time** option is enabled, the TimeSelector.StartDate property is updated as current time minus duration.

**Note:** To set the start date and time of the Alarm Control, use the TimeSelector.SetStartAndEndTimes() Method.

**Syntax**

```
result = AlarmClient.TimeSelector.StartDate;
```

**Example**

```
LogMessage(AlarmClient1.TimeSelector.StartDate);
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### TimeSelector.TimeDuration Property

The TimeSelector.TimeDuration property is a read-write integer property that gets or sets the time duration. The start time of the Alarm control (TimeSelector.StartDate) is calculated as the end time (TimeSelector.EndDate) minus the new time duration.

The TimeSelector.TimeDuration can have one of the following values:

| Value | Description |
|---|---|
| 0 | Custom |
| 1 | The last minute. |
| 2 | The last five minutes. |
| 3 | The last ten minutes. |
| 4 | The last 15 minutes. |
| 5 | The last 30 minutes. |
| 6 | The last hour. |
| 7 | The last two hours. |
| 8 | The last four hours. |
| 9 | The last eight hours. |
| 10 | The last 12 hours. |
| 11 | The last 24 hours. |
| 12 | The last two days. |
| 13 | The last week. |
| 14 | The last two weeks. |
| 15 | The last month. |
| 16 | The last three months. |
| 17 | One minute. |
| 18 | Five minutes. |
| 19 | Ten minutes. |
| 20 | 15 minutes. |
| 21 | 30 minutes. |
| 22 | One hour. |
| 23 | Two hours. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Value | Description |
|---|---|
| 24 | Four hours. |
| 25 | Eight hours. |
| 26 | 12 hours. |
| 27 | 24 hours. |
| 28 | Two days. |
| 29 | One week. |
| 30 | Two weeks. |
| 31 | One month. |
| 32 | Three months. |
| 33 | Yesterday: 0:00:00 of the previous day to 0:00:00 of the current day. |
| 34 | Current day: 0:00:00 of the current day to the current time. |
| 35 | Previous hour: The start of the previous hour to the start of the current hour. |
| 36 | Current hour: The start of the current hour to the current time. |

The default value is 6 (Last Hour).

**Syntax**

```
result = AlarmClient.TimeSelector.TimeDuration;
AlarmClient.TimeSelector.TimeDuration = Value;
```

**Example**

```
AlarmClient1.TimeSelector.TimeDuration = 5;
// The Alarm Control now retrieves alarms from the last 30 minutes.
```

**Remarks**

For more information, see Showing Historical Alarms and/or Events.

### TimeZone.TimeZone Property

The TimeZone.TimeZone property is a read-write string property that gets or sets the time zone of the Alarm Control.

The default value depends on the current setting of the operating system.

If you want to show time stamps using the local time of the computer, set the TimeZone.TimeZone property to an empty string.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Syntax

```
result = AlarmClient.TimeZone.TimeZone;
AlarmClient.TimeZone.TimeZone = TimeZone;
```

### Example

```
AlarmClient1.TimeZone.TimeZone = "(GMT-09:00) Alaska";
```

### Remarks

For more information, see Setting Time Zone and Format.

## TotalRowCount Property

The TotalRowCount property is a read-only integer property that gets the total number of alarm records in the Alarm Control.

For current alarms (and recent alarms and events), the **RowCount** property value is always the same as the **TotalRowCount** property value.

For historical alarms, if the Alarm Control retrieves more alarm records than specified by the **MaxDatabaseRecords** property value, it splits these into multiple pages.

The **RowCount** property value shows how many alarm records are currently shown on the current page, whereas the **TotalRowCount** property value shows how many alarm records are retrieved from the alarm database.

### Syntax

```
Result = AlarmClient.TotalRowCount;
```

### Return Value

Returns the end date and time of the Alarm Control in historical mode.

### Example

```
NTRows = AlarmClient1.TotalRowCount;
If (NTRows > 1000) then
   LogMessage("More than 1000 records are currently in the Alarm Control");
Endif;
```

## UnAckAlarms Property

The UnAckAlarms property is a read-only integer property that gets the number of unacknowledged alarm records in the Alarm Control.

### Syntax

```
Result = AlarmClient.UnackAlarms;
```

### Return Value

Returns the number of unacknowledged alarm records in the Alarm Control.

### Example

```
NUnack = AlarmClient1.UnAckAlarms;
If NUnack > 10 Then
   LogMessage("There are more than 10 unacknowledged alarms in the grid!");
Endif;
```

## UpdateToCurrentTime Property

The UpdateToCurrentTime property is a read-write Boolean property that gets or sets the **Update to Current Time** option.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

If you set this property to TRUE, the Alarm Control end time is set to the current time and the start time is calculated as the difference of end time and duration. Whenever you refresh the Alarm Control, the end time is set as current time.

If you set this property to FALSE, the Alarm Control uses the end time, duration, and start time as defined by the Time Range Picker control.

The default value is TRUE.

**Syntax**

```
result = AlarmClient.UpdateToCurrentTime;
AlarmClient.UpdateToCurrentTime = UpdToCurrTime;
```

**Example**

```
AlarmClient1.UpdateToCurrentTime = 1;
AlarmClient1.Requery();
```

**Remarks**

For more information, see Showing Historical Alarms and/or Events.

### UserQueryFilterFilePath Property

Gets/Sets the file path of the runtime user queries and filters. The file path excludes the file name.

**Syntax**

```
result = AlarmClient.UserQueryFilterFilePath;
AlarmClient.UserQueryFilterFilePath = myUserQueryFilterFilePath;
```

**Example**

```
AlarmClient1.UserQueryFilterFilePath = "C:\Users\Public\AppData\Wonderware";
```

**Remarks**

```
Default is %Userprofile%\Wonderware;
```

### Visible Property

The Visible property is a read-write Boolean property that gets or sets the visibility of the Alarm Control.

**Syntax**

```
result = AlarmClient.Visible;
AlarmClient.Visible = Boolean;
```

### Width Property

The Width property is a read-write integer property that gets or sets the width of the Alarm Control in pixels.

**Syntax**

```
result = AlarmClient.Width;
AlarmClient.Width = Wdth;
```

### WindowColor Property

The WindowColor property is a read-write color property that gets or sets the color of the Alarm Control background.

**Syntax**

```
Color = AlarmClient.WindowColor;
AlarmClient.WindowColor = Color;
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

**Parameters**

*Color*
Color of background.

**Example**

```
AlarmClient1.WindowColor = Color.FromARGB(240,200,198);
```

**Remarks**

For more information, see Setting Heading, Grid, and Window Color.

*Color* is a .NET Framework data type. You can use various Color methods to set the color, such as a predefined color name, FromARGB(), FromKnownColor(), and FromName().

For a list of the .NET color names and the hexadecimal codes, see .NET Colors.

For more information on the color methods, see the online Microsoft documentation for .NET Framework Development.

### X Property

The X property is a read-write integer property that gets or sets the horizontal position of the Alarm Control in relation to the left edge of the InTouch window in which it appears.

**Syntax**

```
result = AlarmClient.X;
AlarmClient.X = LeftPos;
```

### Y Property

The Y property is a read-write integer property that gets or sets the vertical position of the Alarm Control in relation to the top edge of the InTouch window in which it appears.

**Syntax**

```
result = AlarmClient.Y;
AlarmClient.Y = TopPos;
```

## Alarm Control Methods

This section describes the scripting methods available for the Alarm Control.

### AboutBox() Method

The AboutBox method shows the **About** dialog box of the Alarm Control.

**Syntax**

```
AlarmClient.AboutBox();
```

### Ack.All() Method

The Ack.All method acknowledges all alarms in the Alarm Control, including those not shown.

**Syntax**

```
AlarmClient.Ack.All(AckComment);
```

**Parameters**

*AckComment*
A string indicating the alarm acknowledgement comment.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

**Example**

```
AlarmClient1.Ack.All("Alarm is acknowledged");
```

### Ack.Group() Method

The Ack.Group method acknowledges all alarms for a given alarm source and group.

The alarm source and group names are case-insensitive.

**Syntax**

```
AlarmClient.Ack.Group(AlarmSource, Group, AckComment);
```

**Parameters**

*AlarmSource*
The name of the provider and optionally node providing alarms including backslash. For example:

```
   \\node1\galaxy
   \intouch
```

*Group*
The name of the alarm group. For example, $system.

*AckComment*
A string indicating the alarm acknowledgement comment.

**Example**

```
AlarmClient1.Ack.Group("\\machine1\galaxy", "Area_001", "All alarms in Area_001
acknowledged");
```

### Ack.Priority() Method

The Ack.Priority method acknowledges all alarms for a given alarm source, group, and priority range.

The alarm source and group names are case-insensitive.

**Syntax**

```
AlarmClient.Ack.Priority(AlarmSource, Group, FromPriority, ToPriority, AckComment);
```

**Parameters**

*AlarmSource*
The name of the provider and optionally node providing alarms including backslash. For example:

```
   \\node1\galaxy
   \intouch
```

*Group*
The name of the alarm group. For example, $system.

*FromPriority*
Starting priority of alarms. For example, 100.

*ToPriority*
End priority of alarms. For example, 900.

*AckComment*
A string indicating the alarm acknowledgement comment.

**Example**

```
GrpName = "ValveGroup";
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

```
AlarmClient1.Ack.Priority("\intouch", GrpName, 250, 500, "All local InTouch alarms in the
ValveGroup alarm group with priorities from 250 to 500 are now acknowledged.");
```

### Ack.Selected() Method

The Ack.Selected method acknowledges all selected alarms.

**Syntax**

```
AlarmClient.Ack.Selected(AckComment);
```

**Parameters**

*AckComment*
A string indicating the alarm acknowledgement comment.

**Example**

```
AlarmClient1.Ack.Selected("This selected alarm is acknowledged");
```

### Ack.SelectedGroup() Method

The Ack.SelectedGroup method acknowledges all alarms that have the same alarm sources and groups as one or more selected alarms.

**Syntax**

```
AlarmClient.Ack.SelectedGroup(AckComment);
```

**Parameters**

*AckComment*
A string indicating the alarm acknowledgement comment.

**Example**

```
AlarmClient1.Ack.SelectedGroup("Alarm acknowledged");
```

### Ack.SelectedPriority () Method

The Ack.SelectedPriority method acknowledges all alarms that have the same alarm sources, groups, and within the priority ranges as one or more selected alarms.

**Syntax**

```
AlarmClient.Ack.SelectedPriority(AckComment);
```

**Parameters**

*AckComment*
A string indicating the alarm acknowledgement comment.

**Example**

```
AlarmClient1.Ack.SelectedPriority("Alarm acknowledged");
```

### Ack.SelectedTag() Method

The Ack.SelectedTag method acknowledges all alarms that have the same alarm sources, groups, tags, and within the priority ranges as one or more selected alarms.

**Syntax**

```
AlarmClient.Ack.SelectedTag(AckComment);
```

**Parameters**

*AckComment*

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

A string indicating the alarm acknowledgement comment.

**Example**

```
AlarmClient1.Ack.SelectedTag("Alarm acknowledged");
```

### Ack.Tag() Method

The Ack.Tag method acknowledges all alarms for a given alarm source, group, tag name, and priority range.

The alarm source, group names, and tag names are case-insensitive.

**Syntax**

```
AlarmClient.Ack.Tag(AlarmSource, Group, Tag, FromPriority, ToPriority, AckComment);
```

**Parameters**

*AlarmSource*
The name of the provider and optionally node providing alarms including backslash. For example:

```
   \\node1\galaxy
   \intouch
```

*Group*
The name of the alarm group. For example, $system.

*Tag*
The name of the alarm tag. For example, ValveTag1.

*FromPriority*
Starting priority of alarms. For example, 100.

*ToPriority*
End priority of alarms. For example, 900.

*AckComment*
A string indicating the alarm acknowledgement comment.

**Example**

```
AckComment = "All alarm client records of the attribute Valve17 in the group (area)
Vessel_25B of the galaxy on machine25 with priorities from 1 to 99 are now acknowledged.";
AlarmClient1.Ack.Tag("\\machine25\galaxy", "Vessel_25B", "Valve17", 1, 99, AckComment);
```

### Ack.Visible() Method

The Ack.Visible method acknowledges all alarms currently visible in the Alarm Control.

**Syntax**

```
AlarmClient.Ack.Visible(AckComment);
```

**Parameters**

*AckComment*
A string indicating the alarm acknowledgement comment.

**Example**

```
AlarmClient1.Ack.Visible("Alarm acknowledged");
```

### Connect() Method

The Connect method connects the Alarm Control to the Alarm Database.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

**Syntax**

```
AlarmClient.Connect();
```

### Disconnect() Method

The Disconnect method disconnects the Alarm Control from the Alarm Database.

**Syntax**

```
AlarmClient.Disconnect();
```

### Dismiss.All() Method

The Dismiss.All method dismisses all alarms in LATCHED alarm state.

**Syntax**

```
AlarmClient.Dismiss.All(Comments);
```

**Parameters**

*Comments*
A string indicating the alarm dismiss comment.

**Example:**

```
AlarmClient1.Dismiss.All(“all latched alarms are now dismissed”);
```

### Dismiss.Group() Method

The Dismiss.Group method dismisses all currently LATCHED alarms for a given alarm source and group.

**Syntax**

```
AlarmClient.Dismiss.Group(ProviderName,GroupName,Comments);
```

**Parameters**

*ProviderName*
Node and provider name combination that specifies the origin of alarm monitoring. For example:

```
   \\TankServer1\Galaxy
   \InTouch
```

*GroupName*
Alarm group or area name whose alarms are monitored by the Alarm Control. For example:

```
   $System
```

*Comments*
A string indicating the alarm dismiss comment.

**Examples**

```
ProviderName = \\TankServer1\Galaxy
GroupName = Area_001
Comments = All LATCHED alarms in Area_001 are dismissed
AlarmClient1.Dismiss.Group("\\TankServer1\Galaxy","Area_001", “All LATCHED alarms in
Area_001 are dismissed”);
```

### Dismiss.Priority() Method

The Dismiss.Priority method dismisses currently latched alarms within a specified alarm priority range that belong to the same specified provider and alarm group.

**Syntax**

```
AlarmClient1.Dismiss.Priority(ProviderName,GroupName, FromPriority, ToPriority, Comments);
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Parameters

*ProviderName*
Node and provider name combination that specifies the origin of alarm monitoring. For example:

```
\\TankServer1\Galaxy
\intouch
```

*GroupName*
Alarm group or area name whose alarms are monitored by the Alarm Control. For example:

```
$system
```

*FromPriority*
Starting priority of alarms. For example, 100

*ToPriority*
End priority of alarms. For example, 900.

*Comments*
A string indicating the alarm dismiss comment.

### Example

```
ProviderName = \\TankServer1\Galaxy
GroupName = ValveGroup
FromPriority = 250
ToPriority = 500
Comments = alarms are now dismissed
AlarmClient1.Dismiss.Priority("\Galaxy"," ValveGroup",250,500," All local InTouch LATCHED
alarms in the ValveGroup alarm group with priorities from 250 to 500 are now dismissed");
```

## Dismiss.Selected() Method

The Dismiss.Selected method dismisses currently latched alarms selected by the user from the Alarm Control.

### Syntax

```
AlarmClient1.Dismiss.Selected(Comments);
```

### Parameters

*Comments*
A string indicating the alarm dismiss comment.

### Example:

```
Comment = latched alarms are now dismissed
AlarmClient1.Dismiss.Selected(“latched alarms are now dismissed”);
```

## Dismiss.SelectedGroup() Method

The Dismiss.SelectedGroup method dismisses all latched alarms that belong to the same provider and alarm groups as the alarms selected by the user from the Alarm Control.

### Syntax

```
AlarmClient1.Dismiss.SelectedGroup(Comments);
```

### Parameters

*Comments*
A string indicating the alarm dismiss comment.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

**Example:**

```
Comment = latched alarms are now dismissed
AlarmClient1.Dismiss.SelectedGroup(“latched alarms are now dismissed”);
```

### Dismiss.SelectedPriority() Method

The Dismiss.SelectedPriority method dismisses all latched alarms that have the same alarm sources, groups, and within the priority ranges as one or more selected alarms.

**Syntax**

```
AlarmClient1.Dismiss.SelectedPriority(Comments);
```

**Parameters**

*Comments*
A string indicating the alarm dismiss comment.

**Example:**

```
Comment = latched alarms are now dismissed
AlarmClient1.Dismiss.SelectedPriority(“latched alarms are now dismissed”);
```

### Dismiss.SelectedTag() Method

The Dismiss.SelectedTag method dismisses all latched alarms that have the same alarm sources, groups, tags, and within the priority ranges as one or more selected alarms.

**Syntax**

AlarmClient1.Dismiss.SelectedTag(Comments);

**Parameters**

*Comments*
A string indicating the alarm dismiss comment.

**Example:**

```
Comment = latched alarms are now dismissed
AlarmClient1.Dismiss.SelectedTag(“latched alarms are now dismissed”);
```

### Dismiss.Tag() Method

The Dismiss.Tag method dismisses all latched alarms for a given alarm source, group, tag name, and priority range.

The alarm source, group names, and tag names are case-insensitive.

**Syntax**

AlarmClient1.Dismiss.Tag(ProviderName,GroupName,TagName,FromPriority,ToPriority,Comments);

**Parameters**

*ProviderName*
The name of the provider and optionally node providing alarms including backslash. For example: \\node1\galaxy

*GroupName*
The name of the alarm group. For example, $system.

*TagName*

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

The name of the alarm tag. For example, ValveTag1.

*FromPriority*
Starting priority of alarms. For example, 100

*ToPriority*
End priority of alarms. For example, 900.

*Comments*
A string indicating the alarm dismiss comment.

**Example:**

```
ProviderName = \\machine25\galaxy
GroupName = Vessel_25B
TagName = Valve17
FromPriority = 1
ToPriority = 99
Comments = All alarm client records of the attribute Valve17 in the group (area)
Vessel_25B of the galaxy on machine25 with priorities from 1 to 99 are now acknowledged.
AlarmClient1.Dismiss.Tag("\\machine25\galaxy", "Vessel_25B", "Valve17", 1, 99, “All alarm
client records of the attribute Valve17 in the group (area) Vessel_25B of the galaxy on
machine25 with priorities from 1 to 99 are now acknowledged");
```

### Dismiss.Visible() Method

The Dismiss.Visible method dismisses only those latched alarms that are currently visible from the Alarm Control.

**Syntax**

```
AlarmClient1.Dismiss.Visible(Comments);
```

**Parameters**

*Comments*
A string indicating the alarm dismiss comment.

**Example:**

```
Comment = latched alarms are now dismissed
AlarmClient1.Dismiss.Visible(“latched alarms are now dismissed”);
```

### Favorites.Export() Method

The Favorites.Export method exports the list of query and filter favorites list to an XML file.

**Syntax**

```
AlarmClient.Favorites.Export(FilePath, FileName);
```

**Parameters**

*FilePath*
Name of the path to export the query and filter favorites file.

*FileName*
Name of the query and filter favorites file to export.

**Example**

```
AlarmClient1.Favorites.Export("c:\", "MyFavorites.xml");
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Favorites.Import() Method

The Favorites.Import method imports the list of query and filter favorites list from an XML file. You can either overwrite the existing query and filter favorites with the new favorites, or append them.

**Syntax**

```
AlarmClient.Favorites.Import(FilePath, FileName, OverwriteAppend);
```

**Parameters**

*FilePath*
Name of the path to the query and filter favorites file to import.

*FileName*
Name of the query and filter favorites file to import.

*OverwriteAppend*
String determining if the import of the query filter favorites overwrites existing favorites, or appends to existing favorites. Set to one of the following:

- Overwrite to overwrite existing query filter favorites
- Append to append to existing query filter favorites. If a query filter with the same name already exists, it is not overwritten by the query filter in the file

**Example**

```
AlarmClient1.Favorites.Import("c:\MyFavs\", "Favs.xml", "Overwrite");
```

### FreezeDisplay() Method

The FreezeDisplay method freezes or unfreezes the Alarm Control. The following values are possible:

| Value | Description |
|---|---|
| TRUE | Freezes the Alarm Control. |
| FALSE | Unfreezes the Alarm Control. |

**Syntax**

```
AlarmClient.FreezeDisplay(FreezeFlag);
```

**Parameters**

*FreezeFlag*
Boolean value or expression (TRUE = freeze control, FALSE = unfreeze control)

**Example**

```
AlarmClient1.FreezeDisplay($hour > 17 OR $hour<9 );
LogMessage("The Alarm Control is frozen between 6 PM and 8 AM.");
```

### GetItem() Method

The GetItem method returns the data at the given row and column. The row is given as a zero-based index. You need to specify 0 to retrieve data from the 1st row. The column name can either be the original column name, or the displayed column name.

**Syntax**

```
Result = AlarmClient.GetItem(RowNumber, ColumnName);
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Parameters

*RowNumber*
An integer row number for the alarm record containing the value you want to fetch.

*ColumnName*
Name of the column.

### Return Value

Returns the data at the given row and column as a string value.

### Example

```
Data1 = AlarmClient1.GetItem(5, "Current Value");
LogMessage("The current value of the 6th alarm record is " + Data1);
```

### Remarks

To get alarm record data from the currently selected row in a given column name, use the **GetSelectedItem** method.

## GetLastError() Method

The GetLastError method returns the last error message. This is useful if the Hide Errors option is selected.

### Syntax

```
ErrMsg = AlarmClient.GetLastError();
```

### Return Value

Returns the last error message.

### Example

```
ErrMsg = AlarmClient1.GetLastError();
ComboBox1.AddItem(ErrMsg);
```

## GetSelectedItem() Method

The GetSelectedItem method returns the data at the currently selected row and specified column. The column name can either be the original column name, or the displayed column name.

### Syntax

```
Result = AlarmClient.GetSelectedItem(ColumnName);
```

### Parameters

*ColumnName*
Name of the column.

### Return Value

Returns the data in the currently selected row and specified column as a string value.

### Example

```
Data2 = AlarmClient1.GetSelectedItem ("State");
LogMessage("The current state of the selected alarm record is " + Data2);
```

### Remarks

To get alarm record data from a given column name and row index, use the **GetItem** method.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Hide.All() Method

The Hide.All method hides all current alarms in the Alarm Control, including future alarms.

**Syntax**

```
AlarmClient.Hide.All();
```

### Hide.Group() Method

The Hide.Group method hides all alarms for a given alarm source and group.

The alarm source and group names are case-insensitive.

**Syntax**

```
AlarmClient.Hide.Group(AlarmSource, Group);
```

**Parameters**

*AlarmSource*
The name of the provider and optionally node providing alarms including backslash. For example:

```
   \\node1\galaxy
   \intouch
```

*Group*
The name of the alarm group. For example, $system.

**Example**

```
AlarmClient1.Hide.Group("\\machine1\galaxy", "Area_001");
LogMessage("All alarms in Area_001 hidden.");
```

### Hide.Priority() Method

The Hide.Priority method hides all alarms for a given alarm source, group, and priority range.

The alarm source and group names are case-insensitive.

**Syntax**

```
AlarmClient.Hide.Priority(AlarmSource, Group, FromPriority, ToPriority);
```

**Parameters**

*AlarmSource*
The name of the provider and optionally node providing alarms including backslash. For example:

```
   \\node1\galaxy
   \intouch
```

*Group*
The name of the alarm group. For example, $system.

*FromPriority*
Starting priority of alarms. For example, 100.

*ToPriority*
End priority of alarms. For example, 900.

**Example**

```
GrpName = "ValveGroup";
AlarmClient1.Hide.Priority("\intouch", GrpName, 250, 500);
LogMessage("All local InTouch alarms in the ValveGroup alarm group with priorities from
250 to 500 are now hidden.");
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Hide.Selected() Method

The Hide.Selected method hides all selected alarms.

**Syntax**

```
AlarmClient.Hide.Selected();
```

### Hide.SelectedGroup() Method

The Hide.SelectedGroup method hides all alarms that have the same alarm sources and groups as one or more selected alarms.

**Syntax**

```
AlarmClient.Hide.SelectedGroup();
```

### Hide.SelectedPriority() Method

The Hide.SelectedPriority method hides all alarms that have the same alarm sources, groups, and within the priority ranges as one or more selected alarms.

**Syntax**

```
AlarmClient.Hide.SelectedPriority();
```

### Hide.SelectedTag() Method

The Hide.SelectedTag method hides all alarms that have the same alarm sources, groups, tag names, and within the priority ranges as one or more selected alarms.

**Syntax**

```
AlarmClient.Hide.SelectedTag();
```

**Remarks**

None

### Hide.Tag() Method

The Hide.Tag method hides all alarms for a given alarm source, group, tag name, and priority range.

The alarm source, group name, and tag names are case-insensitive.

**Syntax**

```
AlarmClient.Hide.Tag(AlarmSource, Group, Tag, FromPriority, ToPriority);
```

**Parameters**

*AlarmSource*
The name of the provider and optionally node providing alarms including backslash. For example:

```
\\node1\galaxy
\intouch
```

*Group*
The name of the alarm group. For example, $system.

*Tag*
The name of the alarm tag. For example, ValveTag1.

*FromPriority*
Starting priority of alarms. For example, 100.

*ToPriority*

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

End priority of alarms. For example, 900.

**Example**

```
AlarmClient1.Hide.Tag("\\machine25\galaxy", "Vessel_25B", "Valve17", 1, 99);
LogMessage("All alarm client records of the attribute Valve17 in the group (area)
Vessel_25B of the galaxy on machine25 with priorities from 1 to 99 are now hidden.");
```

### Hide.Visible() Method

The Hide.Visible method hides all alarms currently shown in the Alarm Control.

**Syntax**

```
AlarmClient.Hide.Visible();
```

### LoadQueryFilterFile

Load from an xml file with query and filter favorites entries with different override options. Return false for any error.

**Syntax**

```
AlarmClient.LoadQueryFilterFile(FilePath, OverrideOption);
```

**Parameters**

*FilePath*

Name of the path to the query filter favorites file to import.

*OverrideOption*

- **Append:** Add to the query and filter favorites. If a duplicate entry is already present, it will not append.
- **Overwrite:** Delete all current query and filter favorite entries and add the new entries from the file.
- **Replace:** Append and replace any duplicated entries with the contents from the file.

**Example**

```
AlarmClient. LoadQueryFilterFile("c:\users\public\file1.xml","Append")
```

### MoveWindow() Method

The MoveWindow method scrolls the alarm records in the control in a given direction.

**Syntax**

```
AlarmClient.MoveWindow(ScrollDir, Repeat);
```

**Parameters**

*ScrollDir*
String indicating the direction to scroll. This parameter is case-insensitive. See the following table.

| ScrollDir | Description |
|---|---|
| LineDn | Line down. The Repeat parameter controls the number of lines to be scrolled. |
| LineUp | Line up. The Repeat parameter controls the number of lines to be scrolled. |
| PageDn | Page down. The Repeat parameter controls the number of pages to be scrolled. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| ScrollDir | Description |
|---|---|
| PageUp | Page up. The Repeat parameter controls the number of pages to be scrolled. |
| Top | To the top of the control |
| Bottom | To the bottom of the control. |
| PageRt | Page to the right. The Repeat parameter controls the number of pages to be scrolled. |
| PageLf | Page to the left. The Repeat parameter controls the number of pages to be scrolled. |
| Right | Scrolls right. The Repeat parameter controls the number of columns to be scrolled. |
| Left | Scrolls left. The Repeat parameter controls the number of columns to be scrolled. |
| Home | Scrolls to the top row and left most column of the control. |

*Repeat*
Number of times to repeat the scroll action.

**Example**

```
AlarmClient1.MoveWindow("Bottom", 0);
```

### Requery() Method

The Requery method refreshes the alarm records in the Alarm Control.

For current alarms and recent alarms and events, the control requeries the Alarm Manager. For historical alarms or events, the control retrieves alarm records from the Alarm Database.

**Syntax**

```
AlarmClient.Requery();
```

### Reset() Method

The Reset method resets column widths and the column order to their last known design-time settings. The Reset method also resets the current query filter to the default query.

**Syntax**

```
AlarmClient.Reset();
```

### ResetSortCriteria() Method

Reset the sorting criteria back to the design time settings and apply the sorting criteria.

**Syntax**

```
AlarmClient.ResetSortCriteria();
```

### RunQuery() Method

Execute the query or filter available on the Alarm Client Control by name. If the ApplyAsFilter option is true, then execute the query as a filter only. Note the following behaviors:

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- If ApplyAsFilter is true, the parameter QueryName needs to be a valid Filter.
- If ApplyAsFilter is false, the parameter QueryName needs to be a valid Query.
- In all other scenarios, the RunQuery() will not execute.

**Syntax**

```
AlarmClient.RunQuery(QueryName, ApplyAsFilter);
```

**Parameters**

*QueryName*

The name of the query or filter available on the Alarm Client Control.

*ApplyAsFilter*

Specify **True** to execute a query as a filter using the filter criteria and retain the existing alarm subscription.

**Example**

```
AlarmClient.RunQuery("High Alarms", true);
```

### RunQueryFromFile() Method

Execute the query or filter by name defined in a file. This does not impact the current list of queries and filters. If ApplyAsFilter option is true, then execute the query as filter only. Note the following behaviors:

- If ApplyAsFilter is true, the parameter QueryName needs to be a valid Filter.
- If ApplyAsFilter is false, the parameter QueryName needs to be a valid Query.
- In all other scenarios, the RunQuery() will not execute.

**Syntax**

```
AlarmClient.RunQueryFromFile(FilePath, QueryName, ApplyAsFilter);
```

**Parameters**

*FilePath*

The file path to the query filter favorites file to execute.

*QueryName*

The name of the query or filter defined in the user provided file.

*ApplyAsFilter*

Specify **True** to execute a query as a filter using the filter criteria and retain the existing alarm subscription.

**Example**

```
AlarmClient.RunQueryFromFile("C:\UserQueryFilter.xml", "User High Alarms", true);
```

### SelectFilters() Method

The SelectFilters() script function will apply filters to the alarm records basing on the list of filter names in the parameter FilterNames, where each filter name is separate by comma. If FilterNames is empty, no filter will be applied to the alarm records. Invalid filter name will be ignored.

**Syntax**

```
AlarmClient.SelectFilters(FilterNames);
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

**Parameters**

*FilterNames*
The name of the filters which are stored in the filter list. It can be a string constant or a string type reference.

**Example**

```
AlarmClient1.SelectFilters("F1, F3, F5");
```

AlarmClient1.SelectFilters(" ");

### Select.All() Method

The Select.All method selects all alarms in the Alarm Control.

**Syntax**

```
AlarmClient.Select.All();
```

### Select.Group() Method

The Select.Group method selects all alarms for a given provider and group.

**Syntax**

```
AlarmClient.Select.Group(AlarmSource, Group);
```

**Parameters**

*AlarmSource*
The name of the provider and optionally node providing alarms including backslash. For example:

```
   \\node1\galaxy
   \intouch
```

*Group*
The name of the alarm group. For example, $system.

**Example**

```
AlarmClient1.Select.Group("\\machine1\galaxy", "Area_001");
LogMessage("All galaxy alarms of group Area_001 from machine1 are now selected.");
```

### Select.Item() Method

The Select.Item method selects an alarm record at a given zero-based row number.

**Syntax**

```
AlarmClient.Select.Item(RowNumber);
```

**Parameters**

*RowNumber*
An integer row number for the alarm record to select. The first row in the control is 0.

**Example**

```
AlarmClient1.Select.Item(5);
LogMessage("The alarm record in the 6th row (index 5) is now selected.");
```

### Select.Priority() Method

The Select.Priority method selects all alarms for a given alarm source, group, and priority range.

**Syntax**

```
AlarmClient.Select.Priority(AlarmSource, Group, FromPriority, ToPriority);
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Parameters

*AlarmSource*
The name of the provider and optionally node providing alarms including backslash. For example:

```
\\node1\galaxy
\intouch
```

*Group*
The name of the alarm group. For example, $system.

*FromPriority*
Starting priority of alarms. For example, 100.

*ToPriority*
End priority of alarms. For example, 900.

### Example

```
GrpName = "ValveGroup";
AlarmClient1.Select.Priority("\intouch", GrpName, 250, 500);
LogMessage("All local InTouch alarms in the ValveGroup alarm group with priorities from
250 to 500 are now selected.");
```

## Select.Tag() Method

The Select.Tag method selects all alarms for a given alarm source, group, tag name, and priority range.

### Syntax

```
AlarmClient.Select.Tag(AlarmSource, Group, Tag, FromPriority, ToPriority);
```

### Parameters

*AlarmSource*
The name of the provider and optionally node providing alarms including backslash. For example:

```
\\node1\galaxy
\intouch
```

*Group*
The name of the alarm group. For example, $system.

*Tag*
The name of the alarm tag. For example, ValveTag1.

*FromPriority*
Starting priority of alarms. For example, 100.

*ToPriority*
End priority of alarms. For example, 900.

### Example

```
AlarmClient1.Select.Tag("\\machine25\galaxy", "Vessel_25B", "Valve17", 1, 99);
LogMessage("All alarm client records of the attribute Valve17 in the group (area)
Vessel_25B of the galaxy on machine25 with priorities from 1 to 99 are now selected.");
```

## SetSort() Method

The SetSort method sets the level of sorting according to the defined sort columns and sort orders.

### Syntax

```
AlarmClient.SetSort(Level);
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Parameters

*Level*
The level of sorting:

| Value | Description |
|---|---|
| 1 | Only use the first sort column. |
| 2 | Use first and second sort columns. |
| 3 | Use first, second, and third sort columns. |
| 4 | Use first, second, third, and fourth sort columns. |

### Example

```
AlarmClient1.SetSort(2);
```

### Remarks

Use the **Show.Sort** method to open the **Sort** dialog box instead.

## SetSortCriteria() Method

Set the sorting criteria by supplying a string of which columns to sort and their order. Then apply the sort criteria. Return false if any error.

#### Syntax

```
AlarmClient.SetSortCriteria(SortCriteriaString);
```

#### Parameters

*SortCriteriaString*

The string containing the sorting criteria to be executed.

```
The syntax of the sort criteria string is: [CriteriaName]:[1|-1];
```

where:

CriteriaName is the name of the sorting criteria

Colon is separator for sort order integer

Use 1 for Ascending order

Use -1 for Descending order

Semicolon is separator for the next sorting criteria

If ordering integer is not supplied, then default to ascending order

#### Example

```
Example1: Sort by time ascending order and then by Priority ascending order
AlarmClient.SetSortCriteria("TimeLCT:1; Priority:1");
Example2: Sort by time ascending order using default value and then by Priority descending
order
AlarmClient.SetSortCriteria("TimeLCT; Priority:-1");
```

```
Example3: Sort by ascending order in sequence of InAlarm, AckState, Priority, and Time.
AlarmClient.SetSortCriteria("InAlarm;AckState;Priority;TimeLCT");
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

## Shelve.All() Method

The Shelve.All() method shelves all active alarms shown in the Alarm Control.

### Syntax

```
AlarmClient.Shelve.All(Duration=Duration;Reason="Reason");
```

### Parameters

*Duration*
Length of time in hours that selected alarms are shelved. Duration can be specified as an integer or a floating point number greater than 0.

**Example:**

```
   Duration=0.5
```

*Reason*
Explanation up to 200 characters for shelving all active alarms shown in the Alarm Control.
An explanation can be delimited by double or single quotation marks. Quotation marks and back slashes (\) can appear within the text of an explanation. If an explanation is delimited by double quotation marks, a single quotation mark is simply a character in the string. If an explanation is delimited by single quotation marks, a double quotation mark is simply a character in the string.

### Example

```
AlarmClient1.Shelve.All("Duration=0.1;Reason='Shelve all alarms';");
```

### Remarks

For more information about shelving alarms, see Shelving Alarms.

## Shelve.Group() Method

The Shelve.Group() method shelves all alarms belonging to a specified provider and alarm group.

### Syntax

```
AlarmClient.Shelve.Group("ProviderName", "GroupName",Duration=Duration;Reason="Reason");
```

### Parameters

*ProviderName*
Node and provider name combination that specifies the origin of alarm monitoring.

*GroupName*
Alarm group or area name whose alarms are monitored by the Alarm Control.

*Duration*
Length of time in hours that selected alarms are shelved. Duration can be specified as an integer or a floating point number greater than 0.

**Example:**

```
   Duration=0.5
```

*Reason*
Explanation up to 200 characters for shelving alarms by groups shown in the Alarm Control.
An explanation can be delimited by double or single quotation marks. Quotation marks and back slashes (\) can appear within the text of an explanation. If an explanation is delimited by double quotation marks, a single quotation mark is simply a character in the string. If an explanation is delimited by single quotation marks, a double quotation mark is simply a character in the string.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Examples

```
AlarmClient1.Shelve.Group("\\TankServer1\Galaxy","Area_001", Duration=0.1;Reason=" + """
+ "Shelved"+ """ + ";");
AlarmClient1.Shelve.Group("\Galaxy","Area_001",Duration=0.1; Reason=" + """ + "Shelved"+
""" + ";");
```

### Remarks

For more information about specifying provider and group names, see Alarm Queries.

## Shelve.Priority() Method

The Shelve.Priority() method shelves all active alarms within a specified alarm priority range that belong to the same specified provider and alarm group.

### Syntax

```
AlarmClient.Shelve.Priority("ProviderName","GroupName",
FromPriority,ToPriority,Duration=Duration;Reason="Reason");
```

### Parameters

*ProviderName*
Node and provider name combination that specifies the origin of alarm monitoring.

*GroupName*
Alarm group or area name whose alarms are monitored by the Alarm Control.

*FromPriority*
Starting point of the alarm priority range (1-999). The `FromPriority` value must be less than the `ToPriority` value.

*ToPriority*
Three-digit end point of the alarm priority range (2-999). The `ToPriority` value must be greater than the `FromPriority` value.

*Duration*
Length of time in hours that selected alarms are shelved. Duration can be specified as an integer or a floating point number greater than 0.

**Example:**

```
   Duration=0.5
```

*Reason*
Explanation up to 200 characters for shelving alarms by priority range that are shown in the Alarm Control. An explanation can be delimited by double or single quotation marks. Quotation marks and back slashes (\) can appear within the text of an explanation. If an explanation is delimited by double quotation marks, a single quotation mark is simply a character in the string. If an explanation is delimited by single quotation marks, a double quotation mark is simply a character in the string.

### Example

```
AlarmClient1.Shelve.Priority("\Galaxy","Area_001",100,600, Duration=0.1;Reason=" + """ +
"Shelved"+ """ + ";");
```

### Remarks

For more information about setting an alarm priority range, see Set Priority Ranges for Alarm Records.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

## Shelve.Selected() Method

The Shelve.Selected() method shelves one or more active alarms selected by the user from the Alarm Control.

### Syntax

```
AlarmClient.Shelve.Selected("Duration=Duration;Reason='Reason'");
```

### Parameters

*Duration*
Length of time in hours that selected alarms are shelved. Duration can be specified as an integer or a floating point number greater than 0.

**Example:**

```
   Duration=0.5
```

*Reason*
Explanation up to 200 characters for shelving active alarms selected by the user from the Alarm Control.
An explanation can be delimited by double or single quotation marks. Quotation marks and back slashes (\) can appear within the text of an explanation. If an explanation is delimited by double quotation marks, a single quotation mark is simply a character in the string. If an explanation is delimited by single quotation marks, a double quotation mark is simply a character in the string.

### Example

```
AlarmClient.Shelve.Selected("Duration=1.0;Reason='Nuisance alarms'");
```

### Remarks

For more information about selecting alarms to shelve, see Shelving Alarms.

## Shelve.SelectedGroup() Method

The Shelve.Selected.Group method shelves all active alarms that belong to the same alarm groups as the alarms selected by the user from the Alarm Control.

### Syntax

```
AlarmClient.Shelve.SelectedGroup("Duration=Duration;Reason='Reason'");
```

### Parameters

*Duration*
Length of time in hours that selected alarms are shelved. Duration can be specified as an integer or a floating point number greater than 0.

**Example:**

```
   Duration=0.5
```

*Reason*
Explanation up to 200 characters for shelving alarms in the same group as the alarms selected by the user from the Alarm Control.
An explanation can be delimited by double or single quotation marks. Quotation marks and back slashes (\) can appear within the text of an explanation. If an explanation is delimited by double quotation marks, a single quotation mark is simply a character in the string. If an explanation is delimited by single quotation marks, a double quotation mark is simply a character in the string.

### Example

```
AlarmClient.Shelve.SelectedGroup("Duration=1.0;Reason='Low severity nuisance alarms'");
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Remarks

For more information about selecting alarms to shelve, see Shelving Alarms.

## Shelve.SelectedPriority() Method

The Shelve.SelectedPriority method shelves all active alarms that belong to the same alarm priority as the alarms selected by the user from the Alarm Control.

### Syntax

```
AlarmClient.Shelve.SelectedPriority("Duration=Duration;Reason='Reason'");
```

### Parameters

*Duration*
Length of time in hours that selected alarms are shelved. Duration can be specified as an integer or a floating point number greater than 0.

**Example:**

```
   Duration=0.5
```

*Reason*
Explanation up to 200 characters for shelving alarms in the same priority range as the alarms selected by the user from the Alarm Control.
An explanation can be delimited by double or single quotation marks. Quotation marks and back slashes (\) can appear within the text of an explanation. If an explanation is delimited by double quotation marks, a single quotation mark is simply a character in the string. If an explanation is delimited by single quotation marks, a double quotation mark is simply a character in the string.

### Example

```
AlarmClient.Shelve.SelectedPriority("Duration=1.0;Reason='Low priority nuisance alarms'");
```

### Remarks

For more information about selecting alarms to shelve, see Shelving Alarms.

## Shelve.SelectedSeverity() Method

The Shelve.Selected.Severity method shelves all active alarms for a given alarm group, tag name, and severity as the alarms selected by the user from the Alarm Control.

### Syntax

```
AlarmClient.Shelve.SelectedSeverity("Duration=Duration;Reason='Reason'");
```

### Parameters

*Duration*
Length of time in hours that selected alarms are shelved. Duration can be specified as an integer or a floating point number greater than 0.

**Example:**

**Duration=0.5**

*Reason*
Explanation up to 200 characters for shelving alarms at the same severity as the alarms selected by the user from the Alarm Control.
An explanation can be delimited by double or single quotation marks. Quotation marks and back slashes (\) can appear within the text of an explanation. If an explanation is delimited by double quotation marks, a single

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

quotation mark is simply a character in the string. If an explanation is delimited by single quotation marks, a double quotation mark is simply a character in the string.

**Example**

```
AlarmClient.Shelve.SelectedSeverity("Duration=1.0;Reason='Low severity nuisance alarms'");
```

**Remarks**

For more information about selecting alarms to shelve, see Shelving Alarms.

### Shelve.SelectedTag() Method

The Shelve.SelectedTag method shelves all active alarms all active alarms for a given provider, alarm group, and tag name as the alarms selected by the user from the Alarm Control.

**Syntax**

```
AlarmClient.Shelve.SelectedTag("Duration=Duration;Reason='Reason'");
```

**Parameters**

*Duration*
Length of time in hours that selected alarms are shelved. Duration can be specified as an integer or a floating point number greater than 0.

**Example:**

**Duration=0.5**

*Reason*
Explanation up to 200 characters for shelving alarms from the same tags as the alarms selected by the user from the Alarm Control.
An explanation can be delimited by double or single quotation marks. Quotation marks and back slashes (\) can appear within the text of an explanation. If an explanation is delimited by double quotation marks, a single quotation mark is simply a character in the string. If an explanation is delimited by single quotation marks, a double quotation mark is simply a character in the string.

**Example**

```
AlarmClient.Shelve.SelectedTag("Duration=1.0;Reason='Nuisance alarms'");
```

**Remarks**

For more information about selecting alarms to shelve, see Shelving Alarms.

### Shelve.Severity() Method

The Shelve.Severity() method shelves all active alarms of a specified alarm severity that belong to the same specified provider and alarm group.

**Syntax**

```
AlarmClient.Shelve.Severity("ProviderName","GroupName",
Severity,Duration=Duration;Reason="Reason");
```

**Parameters**

*ProviderName*
Node and provider name combination that specifies the origin of alarm monitoring.

*GroupName*
Alarm group or area name whose alarms are monitored by the Alarm Control.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

*Severity*
Single-digit (1-4) alarm severity.

*Duration*
Length of time in hours that selected alarms are shelved. Duration can be specified as an integer or a floating point number greater than 0.

**Example:**

**Duration=0.5**

*Reason*
Explanation up to 200 characters for shelving alarms at a specified severity from the Alarm Control.
An explanation can be delimited by double or single quotation marks. Quotation marks and back slashes (\) can appear within the text of an explanation. If an explanation is delimited by double quotation marks, a single quotation mark is simply a character in the string. If an explanation is delimited by single quotation marks, a double quotation mark is simply a character in the string.

### Example

```
AlarmClient1.Shelve.Severity("\Galaxy","Area_001",3,
Duration=0.1;Reason=" + """ + "Shelved"+ """ + ";");
```

### Remarks

For more information about selecting alarms to shelve, see Shelving Alarms.

## Shelve.Tag() Method

The Shelve.tag() method shelves all active alarms that originate from the same tag and belong to the same provider and alarm group within the same alarm priority range.

### Syntax

```
AlarmClient.Shelve.Tag("ProviderName","GroupName","Tag"
FromPriority,ToPriority,Duration=Duration;Reason="Reason");
```

### Parameters

*ProviderName*
Node and provider name combination that specifies the origin of alarm monitoring.

*GroupName*
Alarm group or area name whose alarms are monitored by the Alarm Control.

*Tag*
Name of the tag whose active alarms have been selected to be shelved.

*FromPriority*
Starting point of the alarm priority range (1-998). The `FromPriority` value must be less than the `ToPriority` value.

*ToPriority*
End point of the alarm priority range (2-999). The `ToPriority` value must be greater than the `FromPriority` value.

*Duration*
Length of time in hours that selected alarms are shelved. Duration can be specified as an integer or a floating point number greater than 0.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

**Example:**

**Duration=0.5**

*Reason*
Explanation up to 200 characters for shelving alarms from the same tags.
An explanation can be delimited by double or single quotation marks. Quotation marks and back slashes (\) can appear within the text of an explanation. If an explanation is delimited by double quotation marks, a single quotation mark is simply a character in the string. If an explanation is delimited by single quotation marks, a double quotation mark is simply a character in the string.

### Example

```
AlarmClient1.Shelve.Tag("\Galaxy","Area_002",
"UserDefined_002.Analog_003",1,999,"Duration=1.5;Reason=" + """ + "Shelved"+ """ + ";");
```

### Remarks

For more information about selecting alarms to shelve, see Shelving Alarms.

## Shelve.Visible() Method

The Shelve.Visible() method shelves only those alarms that are currently visible from the Alarm Control.

### Syntax

```
AlarmClient.Shelve.Visible("Duration=<Duration
Hrs>;Reason="+"<Reason>"+"Shelved"+"<Description>"+";");
```

### Parameters

*Duration*
Length of time in hours that selected alarms are shelved. Duration can be specified as an integer or a floating point number greater than 0.

**Example:**

**Duration=0.5**

*Reason*
Explanation up to 200 characters for shelving all alarms that are visible from the Alarm Control.
An explanation can be delimited by double or single quotation marks. Quotation marks and back slashes (\) can appear within the text of an explanation. If an explanation is delimited by double quotation marks, a single quotation mark is simply a character in the string. If an explanation is delimited by single quotation marks, a double quotation mark is simply a character in the string.

### Examples

```
AlarmClient1.Shelve.Visible("Duration=1.0;
Reason="+"""+"Shelved"+"""+";");
```

### Remarks

For more information about selecting alarms to shelve, see Shelving Alarms.

## Show.Context() Method

The Show.Context method opens the shortcut menu at run time. This method ignores the ShowContextMenu property setting and always shows the context menu.

### Syntax

```
AlarmClient.Show.Context();
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Show.Favorite() Method

The Show.Favorite method opens the **Query Filters** dialog box.

**Syntax**

```
AlarmClient.Show.Favorite();
```

### Show.Hidden() Method

The Show.Hidden method opens the **Hidden Alarms** dialog box.

**Syntax**

```
AlarmClient.Show.Hidden();
```

### Show.Sort() Method

The Show.Sort method opens the **Sort** dialog box.

**Syntax**

```
AlarmClient.Show.Sort();
```

### Show.Statistics() Method

The Show.Statistics method opens the **Alarm Statistics** dialog box.

**Syntax**

```
AlarmClient.Show.Statistics();
```

### TimeSelector.GetStartAndEndTimes() Method

The TimeSelector.GetStartAndEndTimes method gets the start and end times for the query.

**Syntax**

```
AlarmClient.GetStartAndEndTimes(StartTime, EndTime);
```

**Parameters**

*StartTime*
String attribute, custom property, or element property to retrieve the start time.

*EndTime*
String attribute, custom property, or element property to retrieve the end time.

**Example**

```
dim SDate as string;
dim EDate as string;
AlarmClient1.TimeSelector.GetStartAndEndTimes(SDate, EDate);
StartDate = SDate;
EndDate = EDate;
```

### TimeSelector.RefreshTimes() Method

The TimeSelector.RefreshTimes method sets the time period for the query by updating the end time to current time and recalculates the start time based on the new end time and duration.

If you set the Boolean parameter to TRUE, the OnChange event is triggered if the time is updated.

Only use this method, if the **Update to Current Time** option is cleared or the **UpdateToCurrentTime** property is FALSE.

**Note:** This method does not work if the **UpdatetoCurrentTime** property value is TRUE.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

**Syntax**

```
AlarmClient.TimeSelector.RefreshTimes(TriggerEvent);
```

**Example**

```
dtag = 1;
AlarmClient.TimeSelector.RefreshTimes(dtag);
```

### TimeSelector.SetStartAndEndTimes() Method

The TimeSelector.SetStartAndEndTimes method sets the start and end times for a query.

To customize start time, duration, and end time you must set the **UpdateToCurrentTime** property to FALSE and specify one of the following parameter combinations:

- Start time and end time. Set the Duration parameter to 0.
- Start time and duration. Set the EndTime parameter to "".
- End time and duration. Set the StartTime parameter to "".
- Start time, duration, and end time. The Alarm Control shows an error message if start time plus duration is not equal to end time.

**Syntax**

```
AlarmClient.SetStartAndEndTimes(StartTime, EndTime, Duration);
```

**Parameters**

*StartTime*
String value or expression indicating the start time.

*EndTime*
String value or expression indicating the end time.

*Duration*
Duration enum. For more information on possible values, see TimeSelector.TimeDuration Property.

**Example**

```
AlarmClient1.TimeSelector.SetStartAndEndTimes("08/31/2008 15:33:43","09/01/2009
15:33:43",0);
```

### Toggle.All() Method

The Toggle.All method reverses the selection of all alarm records. Selected alarms are cleared, and unselected alarms are selected.

**Syntax**

```
AlarmClient.Toggle.All();
```

### Toggle.Item() Method

The Toggle.Item method reverses the selection of a given alarm record. If the given alarm record is selected, the selection is cleared; otherwise, it is selected.

**Syntax**

```
AlarmClient.Toggle.Item(RowNumber);
```

**Parameters**

*RowNumber*

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

An integer row number for the alarm record to reverse the selection. The first row in the control is 0.

**Example**

```
AlarmClient1.Toggle.Item(5);
LogMessage("The selection of the alarm record in the 6th row (index 5) is now reversed.");
```

### UnhideAll() Method

The UnhideAll method unhides all hidden alarms.

**Syntax**

```
AlarmClient.UnhideAll();
```

### UnSelectAll() Method

The UnSelectAll method unselects all alarm records.

**Syntax**

```
AlarmClient.UnSelectAll();
```

### Unshelve.All() Method

The Unshelve.All() method unshelves all alarms that are currently shelved.

**Syntax**

```
AlarmClient.Unshelve.All(Duration=0;Reason="Reason");
```

**Parameters**

*Duration*
Duration must be set to 0 to unshelve alarms.

*Reason*
Explanation up to 200 characters for unshelving all alarms.
An explanation is optional to unshelve alarms and the Reason parameter can be specified as `Reason=""` to indicate a null explanation.

**Example**

```
AlarmClient1.Unshelve.All(Duration=0;Reason="");
```

**Remarks**

For more information about unshelving alarms, see Unshelve Alarms.

### Unshelve.Group() Method

The Unshelve.Group() method unshelves all currently shelved alarms belonging to a specified provider and alarm group.

**Syntax**

```
AlarmClient.Unshelve.Group("ProviderName","GroupName",
Duration=0;Reason="Reason");
```

**Parameters**

*ProviderName*
Node and or provider name combination that specifies the origin of alarm monitoring.

*GroupName*
Alarm group or area name whose alarms are monitored by the Alarm Control.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

*Duration*
Duration must be set to 0 to unshelve alarms.

*Reason*
Explanation up to 200 characters for unshelving all alarms belonging to a specified group and provider. An explanation is optional to unshelve alarms and the Reason parameter can be specified as `Reason=""` to indicate a null explanation.

### Examples

```
AlarmClient1.Unshelve.Group("\\TankServer1\Galaxy","Area_001",
Reason=" + """ + "Shelved"+ """ + ";");
AlarmClient1.Unshelve.Group("\Galaxy","Area_001",Reason=" + """ + "Shelved"+ """ + ";");
```

### Remarks

For more information about specifying provider and group names, see Alarm Queries.

## Unshelve.Priority() Method

The Unshelve.Priority() method unshelves currently shelved alarms within a specified alarm priority range that belong to the same specified provider and alarm group.

### Syntax

```
AlarmClient.Unshelve.Priority("ProviderName","GroupName",FromPriority,ToPriority,"Duration=
<Duration>;Reason="+"<Reason>"+"UnShelved"+"<Description>"+";");
```

### Parameters

*ProviderName*
Node and provider name combination that specifies the origin of alarm monitoring.

*GroupName*
Alarm group or area name whose alarms are monitored by the Alarm Control.

*FromPriority*
Three-digit starting point of the alarm priority range. The `FromPriority` value must be less than the `ToPriority` value.

*ToPriority*
Three-digit end point of the alarm priority range. The `ToPriority` value must be greater than the `FromPriority` value.

*Duration*
Duration must be set to 0 to unshelve alarms.

*Reason*
Explanation up to 200 characters for unshelving all alarms belonging to a specified alarm priority range. An explanation is optional to unshelve alarms and the Reason parameter can be specified as `Reason=""` to indicate a null explanation.

### Example

```
AlarmClient1.Unshelve.Priority("\Galaxy","Area_001",100,600,"Duration=0;Reason="+"""+"UnSh
elved"+"""+";");
```

### Remarks

For more information about unshelving alarms, see Unshelve Alarms.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Unshelve.Selected() Method

The Unshelve.Selected() method unshelves currently shelved alarms selected by the user from the Alarm Control.

#### Syntax

```
AlarmClient.Unshelve.Selected(Duration=0;Reason="Reason");
```

#### Parameters

*Duration*
Duration must be set to 0 to unshelve alarms.

*Reason*
Explanation up to 200 characters for unshelving alarms selected by the user.
An explanation is optional to unshelve alarms and the Reason parameter can be specified as `Reason=""` to indicate a null explanation.

#### Example

```
AlarmClient.Unshelve.Selected(Duration=0;Reason="Maintenance finished");
```

#### Remarks

For more information about unshelving alarms, see Unshelve Alarms.

### Unshelve.SelectedGroup() Method

The Unshelve.SelectedGroup() method unshelves all alarms that belong to the same provider and alarm groups as the alarms selected by the user from the Alarm Control.

#### Syntax

```
AlarmClient.Unshelve.SelectedGroup(Duration=0;Reason="Reason");
```

#### Parameters

*Duration*
Duration must be set to 0 to unshelve alarms.

*Reason*
Explanation up to 200 characters for unshelving alarms that belong to the same alarm groups as the alarms selected by the user.
An explanation is optional to unshelve alarms and the Reason parameter can be specified as `Reason=""` to indicate a null explanation.

#### Example

```
AlarmClient.Unshelve.SelectedGroup(Duration=0;Reason="");
```

#### Remarks

For more information about unshelving alarms, see Unshelve Alarms.

### Unshelve.SelectedPriority() Method

The Unshelve.SelectedPriority method unshelves all alarms within the same alarm priority range as the alarms selected by the user from the Alarm Control.

#### Syntax

```
AlarmClient.Unshelve.SelectedPriority(Duration=0;Reason="Reason");
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Parameters

*Duration*
Duration must be set to 0 to unshelve alarms.

*Reason*
Explanation up to 200 characters for unshelving the alarms within the same alarm priority range as the alarms selected by the user.
An explanation is optional to unshelve alarms and the Reason parameter can be specified as `Reason=""` to indicate a null explanation.

### Example

```
AlarmClient.Unshelve.SelectedPriority(Duration=0;
Reason="Maintenance finished");
```

### Remarks

For more information about unshelving alarms, see Unshelve Alarms.

## Unshelve.SelectedSeverity() Method

The Unshelve.SelectedSeverity method unshelves all shelved alarms within the same alarm severities as the alarms selected by the user from the Alarm Control.

### Syntax

```
AlarmClient.Unshelve.SelectedSeverity(Duration=0;Reason="Reason");
```

### Parameters

*Duration*
Duration must be set to 0 to unshelve alarms.

*Reason*
Explanation up to 200 characters for unshelving the shelved alarms that belong to the same alarm severities as the alarms selected by the user.
An explanation is optional to unshelve alarms and the Reason parameter can be specified as `Reason=""` to indicate a null explanation.

### Example

```
AlarmClient.Unshelve.SelectedSeverity(Duration=0;Reason="Low severity alarms");
```

### Remarks

For more information about unshelving alarms, see Unshelve Alarms.

## Unshelve.SelectedTag() Method

The Unshelve.SelectedTag method unshelves all shelved alarms that originate from the same tags as the alarms selected by the user from the Alarm Control.

### Syntax

```
AlarmClient.Unshelve.SelectedTag(Duration=0;Reason="Reason");
```

### Parameters

*Duration*
Duration must be set to 0 to unshelve alarms.

*Reason*

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

Explanation up to 200 characters for unshelving the active alarms from the same tags as the alarms selected by the user.
An explanation is optional to unshelve alarms and the Reason parameter can be specified as `Reason=""` to indicate a null explanation.

**Example**

```
AlarmClient.Unshelve.SelectedTag(Duration=0;Reason="");
```

**Remarks**

For more information about unshelving alarms, see Unshelve Alarms.

### Unshelve.Severity() Method

The Unshelve.Severity() method unshelves all shelved alarms of a specified alarm severity that belong to the same specified provider and alarm group.

**Syntax**

```
AlarmClient.Unshelve.Severity("ProviderName","GroupName",Severity,"Duration=<Duration>;Reason="+"<Reason>"+"UnShelved"+"<Description>"+";");
```

**Parameters**

*ProviderName*
Node and provider name combination that specifies the origin of alarm monitoring.

*GroupName*
Alarm group or area name whose alarms are monitored by the Alarm Control.

*Severity*
Single-digit (1-4) alarm severity.

*Duration*
Duration must be set to 0 to unshelve alarms.

*Reason*
Explanation up to 200 characters for unshelving the active alarms of the specified severity.
An explanation is optional to unshelve alarms and the Reason parameter can be specified as `Reason=""` to indicate a null explanation.

**Example**

```
AlarmClient1.Unshelve.Severity("\Galaxy","Area_001",3,"Duration=0;Reason="+""""+"UnShelved"+""""+";");
```

**Remarks**

For more information about unshelving alarms, see Unshelve Alarms.

### Unshelve.Tag() Method

The Unshelve.Tag() method unshelves all shelved alarms that have the same tag names from the same provider and alarm groups and are within the same priority range.

**Syntax**

```
AlarmClient.UnShelve.Tag("ProviderName","GroupName","Tag",FromPriority,ToPriority,"Duration=<Duration>;Reason="+"<Reason>"+"UnShelved"+"<Description>"+";");
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Parameters

*ProviderName*
Node and provider name combination that specifies the origin of alarm monitoring.

*GroupName*
Alarm group or area name whose alarms are monitored by the Alarm Control.

*Tag*
Name of the tag whose active alarms have been selected to be unshelved.

*FromPriority*
Three-digit starting point of the alarm priority range. The `FromPriority` value must be less than the `ToPriority` value.

*ToPriority*
Three-digit end point of the alarm priority range. The `ToPriority` value must be greater than the `FromPriority` value.

*Duration*
Duration must be set to 0 to unshelve alarms.

*Reason*
Explanation up to 200 characters for shelving the active alarms that belong to the same alarm severities as the alarms selected by the user.
An explanation is optional to unshelve alarms and the Reason parameter can be specified as `Reason=""` to indicate a null explanation.

### Example

```
AlarmClient1.UnShelve.Tag("\Galaxy","Area_001","User_Defined_001.Attribute004.LoLo",1,999,"
Duration=0;Reason="+"""+"UnShelved"+"""+";");
```

### Remarks

For more information about unshelving alarms, see Unshelve Alarms.

## Unshelve.Visible() Method

Th Unshelve.Visible() method unshelves only those alarms that are currently visible from the Alarm Control.

### Syntax

```
AlarmClient.Unshelve.Visible("Duration=<Duration>;Reason="+"<Reason>"+"UnShelved"+"<Descrip
tion>"+";");
```

### Parameters

*Duration*
Duration must be set to 0 to unshelve alarms.

*Reason*
Explanation up to 200 characters for unshelving the alarms currently shown from the Alarm Control.
An explanation is optional to unshelve alarms and the Reason parameter can be specified as Reason="" to indicate a null explanation.

### Example

```
AlarmClient1.Unshelve.Visible("Duration=0;Reason="+"""+"UnShelved"+"""+";");
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Remarks

For more information about unshelving alarms, see Unshelve Alarms.

## Configuring Events

You can execute an action script when the Alarm Control triggers an event. Examples of basic events are:

- Click: The user clicks the Alarm Control
- DoubleClick: The user double-clicks the Alarm Control
- Startup: The Alarm Control opens at run time
- Shutdown: The Alarm Control closes at run time

The Click, Double Click, Start up, and Shutdown events are standard for all .NET client controls. For more information, see the Creating and Managing Industrial Graphics Users Guide.

The Alarm Control has one event of its own that is triggered when a new alarm occurs, the NewAlarm event.

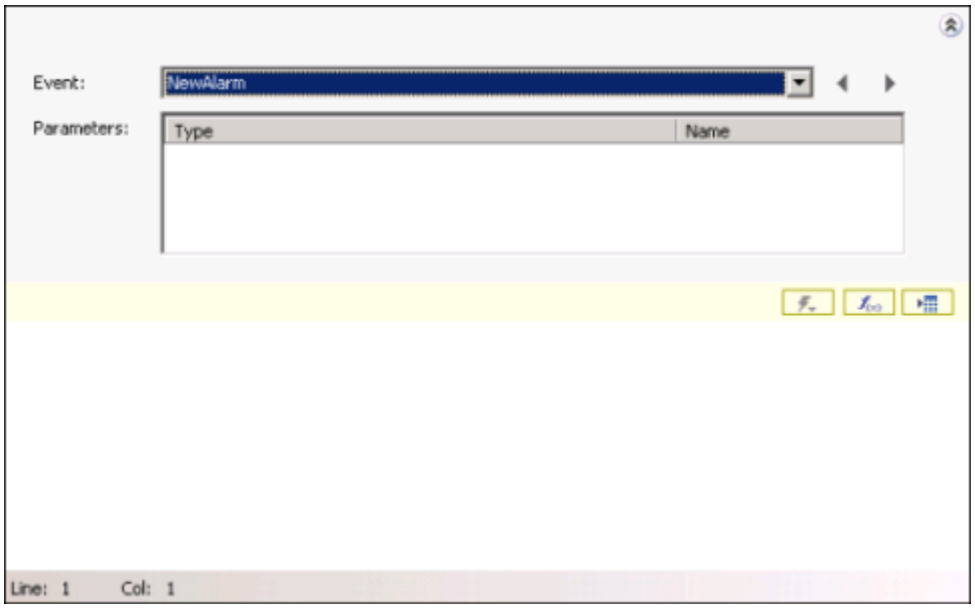
### Configuring the NewAlarm Event

You can configure the NewAlarm event to execute an Industrial graphic script whenever a new alarm occurs.

You can control the trigger behavior with the NewAlarmEventMode property. For more information, see NewAlarmEventMode Property.

#### To configure the NewAlarm event

1. Double-click the Alarm Control. The **Edit Animations** dialog box appears.
2. Click **Event**. The **Event** page appears.
3. In the **Event** list, click **NewAlarm**.




4. In the script area, type the script you want to execute when a new alarm occurs, for example:

```
AlertIcon.Visible = true;
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

5. You must also set the NewAlarmEventMode property to 1 or 2 to enable the NewAlarm event trigger. Do the following:
   a. On the **Special** menu, click **Scripts**. The **Edit Scripts** dialog box appears.
   b. Make sure **Trigger type** is set to **On Show**.
   c. In the script area, type the following:
      ```
      AlarmClient1.NewAlarmEventMode = 1;
      ```
   d. If you want the script to be executed every time a new alarm occurs, set the NewAlarmEventMode property to 2 instead.
   e. Click **OK**.

## .NET Colors

The following table is an overview of the .NET color names with hexadecimal code.

| Color with Hex Code | Color with Hex Code | Color with Hex Code |
|---|---|---|
| AliceBlue #F0F8FF | AntiqueWhite #FAEBD7 | Aqua #00FFFF |
| Aquamarine #7FFFD4 | Azure #F0FFFF | Beige #F5F5DC |
| Bisque #FFE4C4 | Black #000000 | BlanchedAlmond #FFEBCD |
| Blue #0000FF | BlueViolet #8A2BE2 | Brown #A52A2A |
| BurlyWood #DEB887 | CadetBlue #5F9EA0 | Chartreuse #7FFF00 |
| Chocolate #D2691E | Coral #FF7F50 | CornflowerBlue #6495ED |
| Cornsilk #FFF8DC | Crimson #DC143C | Cyan #00FFFF |
| DarkBlue #00008B | DarkCyan #008B8B | DarkGoldenrod #B8860B |
| DarkGray #A9A9A9 | DarkGreen #006400 | DarkKhaki #BDB76B |
| DarkMagenta #8B008B | DarkOliveGreen #556B2F | DarkOrange #FF8C00 |
| DarkOrchid #9932CC | DarkRed #8B0000 | DarkSalmon #E9967A |
| DarkSeaGreen #8FBC8B | DarkSlateBlue #483D8B | DarkSlateGray #2F4F4F |
| DarkTurquoise #00CED1 | DarkViolet #9400D3 | DeepPink #FF1493 |
| DeepSkyBlue #00BFFF | DimGray #696969 | DodgerBlue #1E90FF |
| Firebrick #B22222 | FloralWhite #FFFAF0 | ForestGreen #228B22 |
| Fuchsia #FF00FF | Gainsboro #DCDCDC | GhostWhite #F8F8FF |
| Gold #FFD700 | Goldenrod #DAA520 | Gray #808080 |
| Green #008000 | GreenYellow #ADFF2F | Honeydew #F0FFF0 |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Color with Hex Code | Color with Hex Code | Color with Hex Code |
|---|---|---|
| HotPink #FF69B4 | IndianRed #CD5C5C | Indigo #4B0082 |
| Ivory #FFFFF0 | Khaki #F0E68C | Lavender #E6E6FA |
| LavenderBlush #FFF0F5 | LawnGreen #7CFC00 | LemonChiffon #FFFACD |
| LightBlue #ADD8E6 | LightCoral #F08080 | LightCyan #E0FFFF |
| LightGoldenrodYellow #FAFAD2 | LightGray #D3D3D3 | LightGreen #90EE90 |
| LightPink #FFB6C1 | LightSalmon #FFA07A | LightSeaGreen #20B2AA |
| LightSkyBlue #87CEFA | LightSlateGray #778899 | LightSteelBlue #B0C4DE |
| LightYellow #FFFFE0 | Lime #00FF00 | LimeGreen #32CD32 |
| Linen #FAF0E6 | Magenta #FF00FF | Maroon #800000 |
| MediumAquamarine #66CDAA | MediumBlue #0000CD | MediumOrchid #BA55D3 |
| MediumPurple #9370DB | MediumSeaGreen #3CB371 | MediumSlateBlue #7B68EE |
| MediumSpringGreen #00FA9A | MediumTurquoise #48D1CC | MediumVioletRed #C71585 |
| MidnightBlue #191970 | MintCream #F5FFFA | MistyRose #FFE4E1 |
| Moccasin #FFE4B5 | NavajoWhite #FFDEAD | Navy #000080 |
| OldLace #FDF5E6 | Olive #808000 | OliveDrab #6B8E23 |
| Orange #FFA500 | OrangeRed #FF4500 | Orchid #DA70D6 |
| PaleGoldenrod #EEE8AA | PaleGreen #98FB98 | PaleTurquoise #AFEEEE |
| PaleVioletRed #DB7093 | PapayaWhip #FFEFD5 | PeachPuff #FFDAB9 |
| Peru #CD853F | Pink #FFC0CB | Plum #DDA0DD |
| PowderBlue #B0E0E6 | Purple #800080 | Red #FF0000 |
| RosyBrown #BC8F8F | RoyalBlue #4169E1 | SaddleBrown #8B4513 |
| Salmon #FA8072 | SandyBrown #F4A460 | SeaGreen #2E8B57 |
| SeaShell #FFF5EE | Sienna #A0522D | Silver #C0C0C0 |
| SkyBlue #87CEEB | SlateBlue #6A5ACD | SlateGray #708090 |
| Snow #FFFAFA | SpringGreen #00FF7F | SteelBlue #4682B4 |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Color with Hex Code | Color with Hex Code | Color with Hex Code |
|---|---|---|
| Tan #D2B48C | Teal #008080 | Thistle #D8BFD8 |
| Tomato #FF6347 | Transparent #FFFFFF | Turquoise #40E0D0 |
| Violet #EE82EE | Wheat #F5DEB3 | White #FFFFFF |
| WhiteSmoke #F5F5F5 | Yellow #FFFF00 | YellowGreen #9ACD32 |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Transferring Alarm Configuration from InTouch

You can transfer the configuration of the InTouch Alarm Viewer control and the InTouch Alarm DB View control to the configuration of the Alarm Client Control.

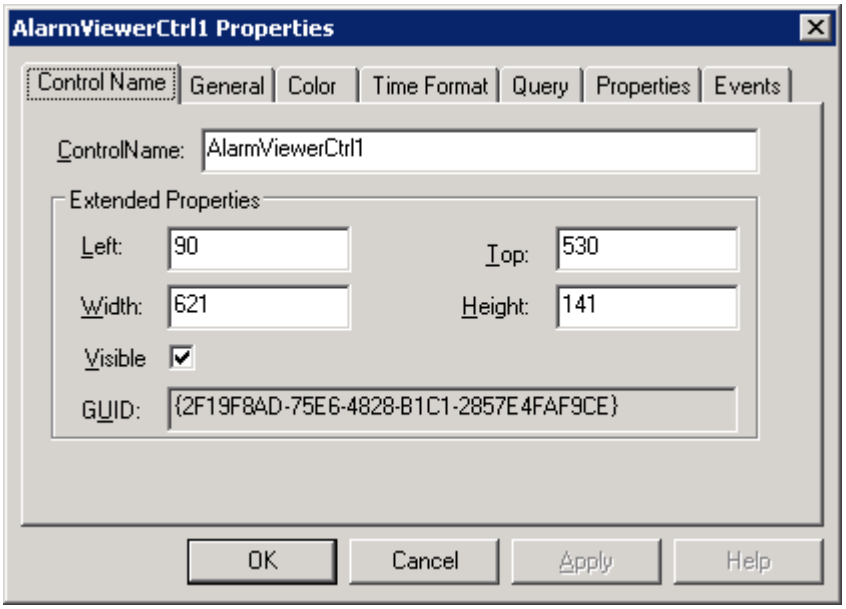
You can also map the InTouch alarm control properties and methods to the properties and methods of the Alarm Client Control.

## Transferring the InTouch Alarm Viewer Control Configuration

You can transfer the configuration of the InTouch Alarm Viewer control tabs options to the Alarm Client Control.

### Transferring Configuration of the Control Name Tab

You can transfer the configuration of the **Control Name** tab options of the InTouch Alarm Viewer control to the Alarm Client Control.

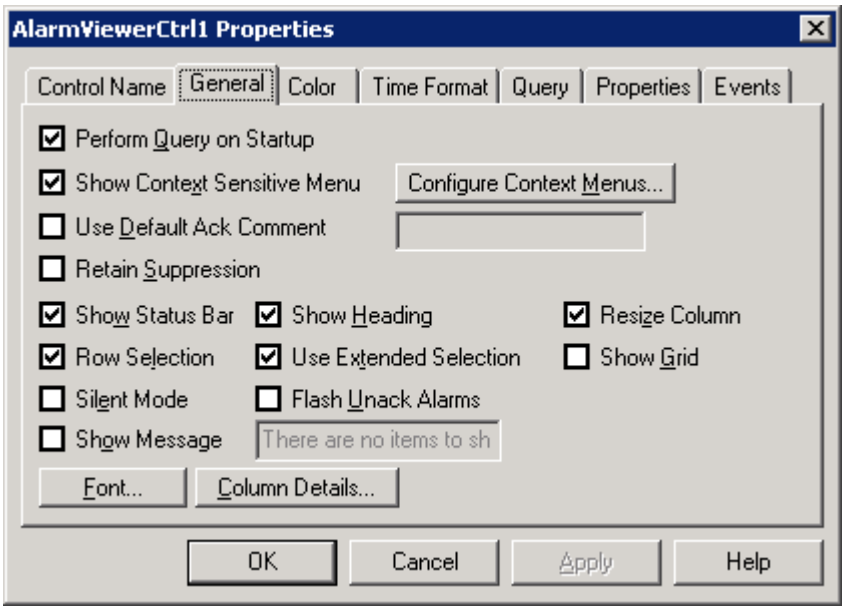



| InTouch option | Alarm Control option |
|---|---|
| ControlName | You can rename the Alarm Client Control the same way as any other elements on the canvas. For more information, see the Creating and Managing Industrial Graphics User's Guide. |
| Left, Top, Width, and Height | You can directly edit the positioning options in the same way as any other element on the canvas. Edit the following properties in the Properties Editor: **X**, **Y**, **Width**, and **Height**. |
| Visible | You can directly edit the visibility option in the same way as any other element on the canvas. In the Properties Editor, edit the **Visible** property. |
| GUID | This option has no meaning in the Alarm Client Control. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Transferring Configuration of the General Tab

You can transfer the configuration of the **General** tab options of the InTouch Alarm Viewer control to the Alarm Client Control.



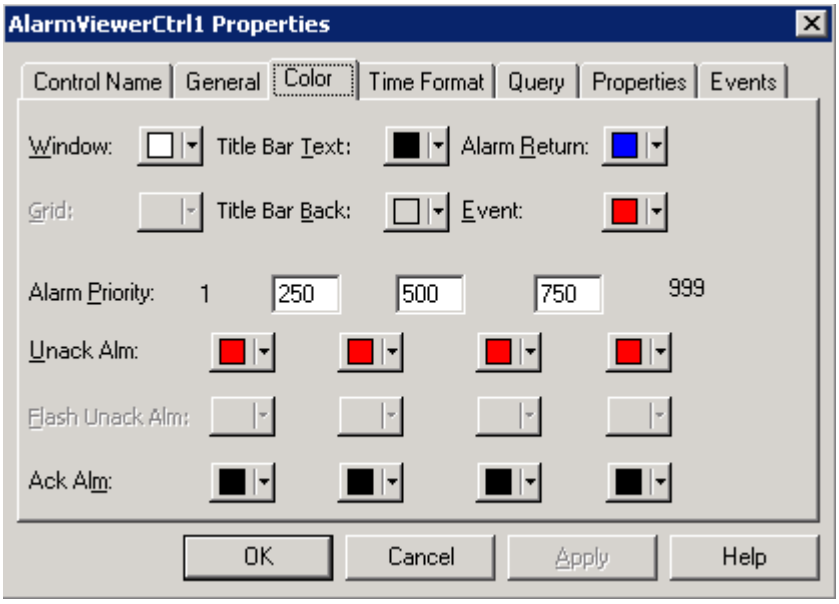

| InTouch option | Alarm Control option |
|---|---|
| Perform Query on Startup | In the Alarm Client Control, this option is called **Query on Startup.** You can configure this option on the **Run-Time Behavior** page. |
| Show Context Sensitive Menu | In the Alarm Client Control, this option is called **Show Context Menu**. You can configure this option on the **Run-Time Behavior** page. |
| Configure Context Menus | In the Alarm Client Control, you can configure the availability of individual shortcut menu options at run-time directly on the **Run-Time Behavior** page. |
| Use Default Ack Comment | In the Alarm Client Control, you can configure the availability of the **Query Filters** shortcut menu option on the **Run-Time Behavior** page. |
| Retain Suppression | In the Alarm Client Control, this option is called **Retain Hidden**. You can configure it on the **Run-Time Behavior** page. |
| Show Status Bar | In the Alarm Client Control, you can configure the **Show Grid** option on the **Run-Time Behavior** page. |
| Show Heading | In the Alarm Client Control, you can configure the **Show Status Bar** option on the **Run-Time Behavior** page. |
| Row Selection | In the Alarm Client Control, this option is called **Row Selection**. You can configure it on the **Run-Time Behavior** page. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| InTouch option | Alarm Control option |
|---|---|
| Use Extended Selection | In the Alarm Client Control, this option is called **Row Selection**. You can configure it on the **Run-Time Behavior** page. |
| Show Grid | In the Alarm Client Control, you can configure the **Show Grid** option on the **Run-Time Behavior** page. |
| Retrieve Buttons | In the Alarm Client Control, the retrieve buttons are not available. The underlying grid technology handles the alarm retrieval from the alarm database. |
| Silent Mode | In the Alarm Client Control, this option is called **Hide Errors and Warnings**. You can configure it on the **Run-Time Behavior** page. |
| Flash Unack Alarms | In the Alarm Client Control, you can configure the **Flash Unack Alarms** option on the **Colors** page. |
| Show Message | In the Alarm Client Control, this option is called **Show Custom 'No Records' Message**. You can configure it on the **Run-Time Behavior** page. |
| Font | You can configure this option from the Industrial Graphic Editor page. Select the Alarm Client Control on the canvas and select an appropriate font type, size, and style on the menu bars. |
| Column Details | In Alarm Client Control, you can configure the column details directly on the **Column Details** page. |

### Transferring Configuration of the Color Tab

You can transfer the configuration of the **Color** tab options of the InTouch Alarm Viewer control to the Alarm Client Control.




© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

All the options of the **Color** tab in the InTouch Alarm Viewer control can be set on the **Colors** page of the Alarm Client Control.

The following table shows you some minor differences in wording:

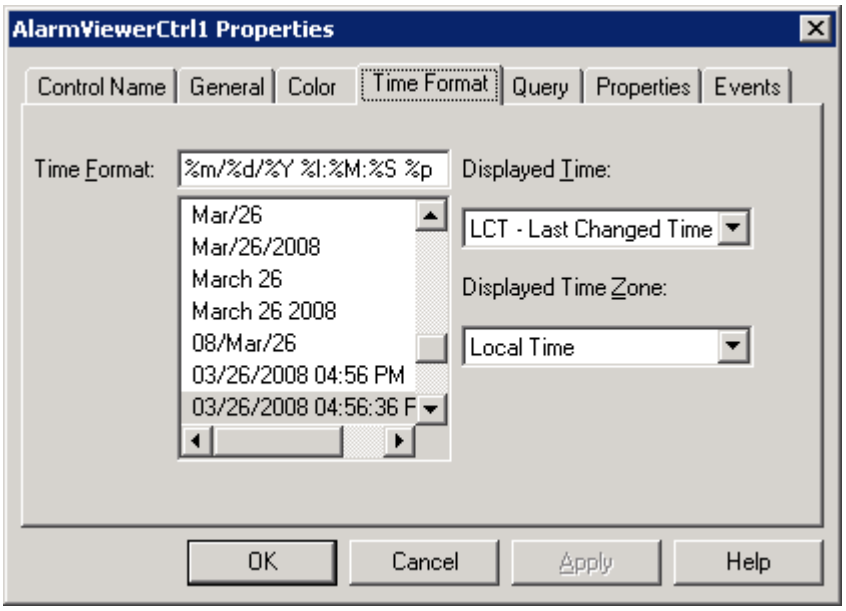
| InTouch Alarm View control | Alarm Client Control |
|---|---|
| Title Bar Text | Heading Text |
| Title Bar Back | Heading Background |
| Alarm Return | Alarm RTN |

you can also set he background color in addition to the text color for most of the alarm records.

You can set the alarm priority range breakpoints directly in the table in the **From Pri** column.

### Transferring Configuration of the Time Format Tab

You can transfer the configuration of the **Time Format** tab options of the InTouch Alarm Viewer control to the Alarm Client Control.



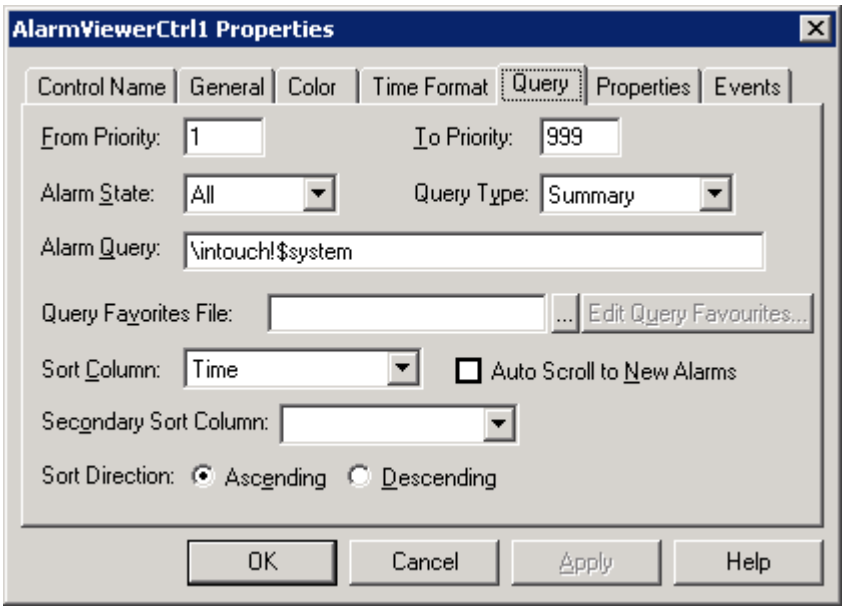

| InTouch option | Alarm Control option |
|---|---|
| Time Format | In the Alarm Client Control, you can configure the **Time Format** option on the **Time Settings** page. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| InTouch option | Alarm Control option |
|---|---|
| Displayed Time | This option has no meaning in the Alarm Client Control. All alarm records are shown with the following time stamps in the Alarm Control grid:<br>• **Time (OAT)**: Original Alarm Time<br>• **Time (LCT)**: Last Changed Time<br>• **Time (LCT, OAT)**: Last Changed Time, but Original Alarm Time if the alarm record is unacknowledged |
| Displayed Time Zone | In the Alarm Client Control, this option is called **Time Zone**. You can configure it on the **Time Settings** page.<br>You need to explicitly configure the time zone for the correct time stamp. |

### Transferring Configuration of the Query Tab

You can transfer the configuration of the **Query** tab options of the InTouch Alarm Viewer control to the Alarm Client Control.




| InTouch option | Alarm Client Control option |
|---|---|
| From Priority, To Priority | In the Alarm Client Control, you can only set the priority limits as part of a query filter on the **Query Filters** page. For more information, see Filter Alarms. |
| Alarm State | In the Alarm Client Control, you can only set the alarm state limitation as part of a query filter on the **Query Filters** page. for more information, see Filter Alarms. |

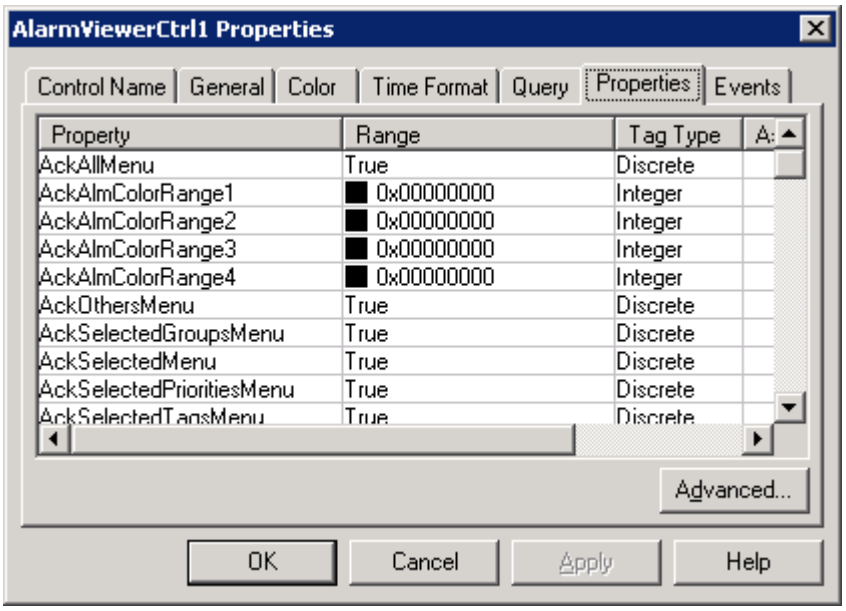
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| InTouch option | Alarm Client Control option |
|---|---|
| Query Type | In the Alarm Client Control, you can set the **Client Mode** option on the **Alarm Mode** page as follow:<br>• For query type "Summery", set the client mode to **Current Alarms**<br>• For query type "Historical", set the client mode to **Recent Alarms and Events** |
| Alarm Query | In the Alarm Client Control, you can configure the **Alarm Query** option on the **Alarm Mode** page. |
| Query Favorites File, Edit Query Favorites | In the Alarm Client Control, all query favorites and filter favorites are managed on one page and are interchangeable between different client modes. To access the Query Filter Favorites, open the **Query Filters** page. |
| Sort Column | In the Alarm Client Control, you can configure the sorting of alarm records on the **Column Details** page. |
| Auto Scroll to New Alarms | In the Alarm Client Control, you can configure the **Auto Scroll to New Alarms** on the **Run-Time Behavior** page. |
| Secondary Sort Column, Sort Direction | In the Alarm Client Control, you can configure the sorting of alarm records on the **Column Details** page. |

### Transferring Configuration of the Properties Tab

You can set the properties of the Alarm Client Control in the **Properties Editor** when the Alarm Control is selected on the canvas.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




For more information on the exact mapping between the InTouch Alarm Viewer control properties and Alarm Client Control properties, see Mapping Properties and Methods.

The advanced property filtering feature does not exist in the Alarm Client Control. However, when you browse for properties of the Alarm Client Control from other elements with the **Galaxy Browser**, you can filter the properties. Also, the properties of the Alarm Client Control are logically grouped in the Properties Editor.

### Transferring Script Configuration on the Events Tab

You can configure scripts for events of the Alarm Client Control on the **Event** animation page. The events are the same as the events for the InTouch Alarm Viewer Control:

- Click
- DoubleClick
- New Alarm
- Shutdown
- StartUp

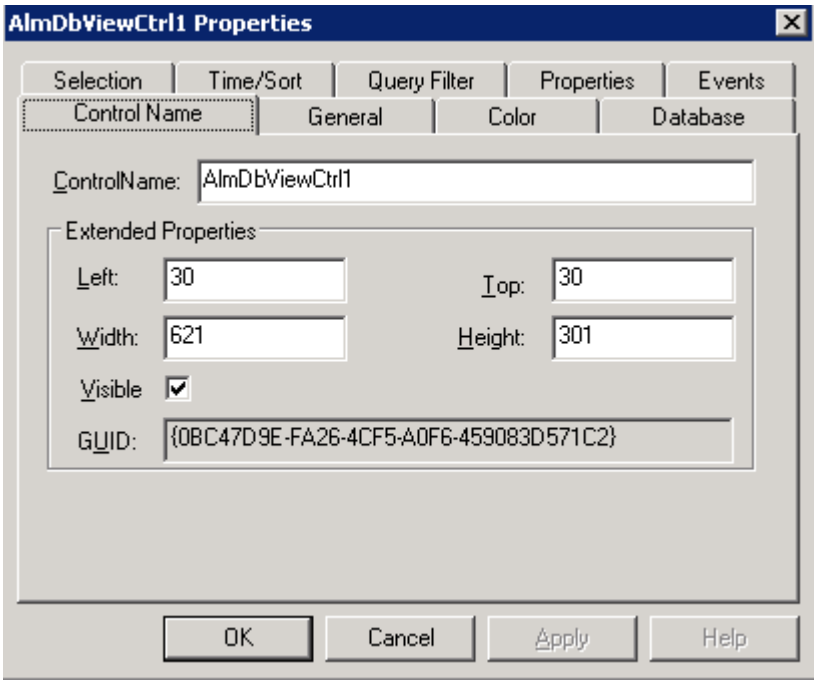
## Transferring the InTouch Alarm DB View Control Configuration

You can transfer the configuration of the InTouch Alarm DB View control tabs options to the Alarm Client Control.

### Transferring Configuration of the Alarm DB View Control Name Tab

You can transfer the configuration of the **Control Name** tab options of the InTouch Alarm DB View control to the Alarm Client Control.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

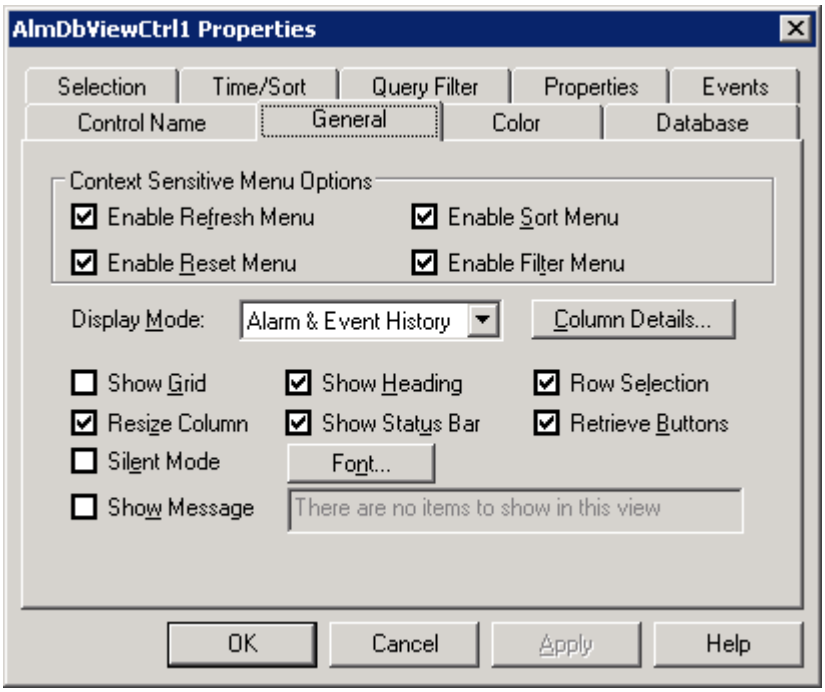



| InTouch option | Alarm Control option |
|---|---|
| ControlName | You can rename the Alarm Client Control the same way as any other elements on the canvas. For more information, see the Creating and Managing Industrial Graphics User's Guide. |
| Left, Top, Width, and Height | You can directly edit the positioning options in the same way as any other element on the canvas. Edit the following properties in the Properties Editor: **X**, **Y**, **Width**, and **Height**. |
| Visible | You can directly edit the visibility option in the same way as any other element on the canvas. In the Properties Editor, edit the **Visible** property. |
| GUID | This option has no meaning in the Alarm Client Control. |

### Transferring Configuration of the InTouch Alarm DB View General Tab

You can transfer the configuration of the **General** tab options of the InTouch Alarm DB View control to the Alarm Client Control.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.



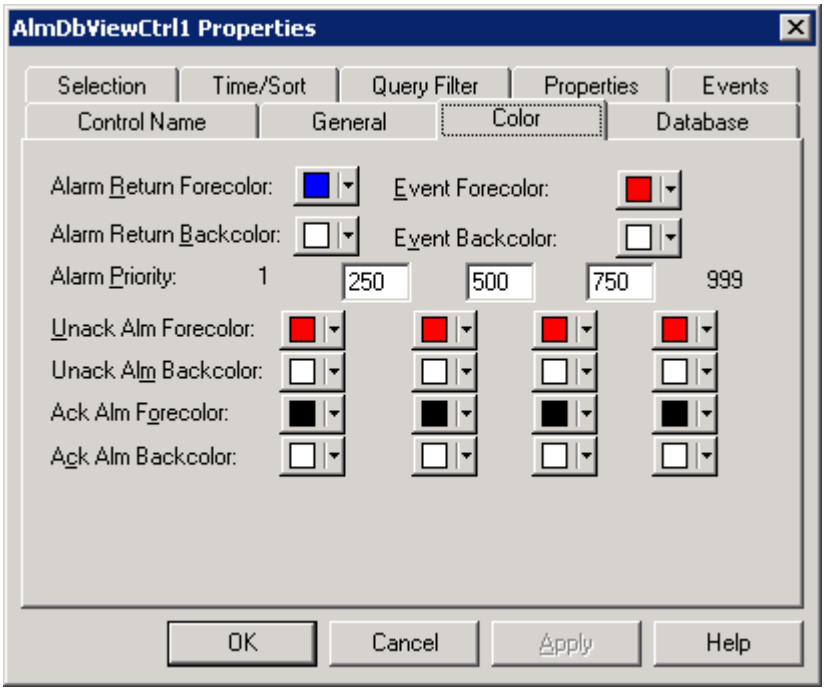

| InTouch option | Alarm Control option |
|---|---|
| Enable Refresh Menu | In the Alarm Client Control, you can configure the availability of the **Requery** shortcut menu option on the **Run-Time Behavior** page. |
| Enable Sort Menu | In the Alarm Client Control, you can configure the availability of the **Sort** shortcut menu option on the **Run-Time Behavior** page. |
| Enabled Reset Menu | In the Alarm Client Control, you can configure the availability of the **Reset** shortcut menu option on the **Run-Time Behavior** page. |
| Enabled Filter Menu | In the Alarm Client Control, you can configure the availability of the **Query Filters** shortcut menu option on the **Run-Time Behavior** page. |
| Display Mode | In the Alarm Client Control, set the **Client Mode** on the **Alarm Mode** page to the same setting as the **Display Mode** setting in the InTouch Alarm DB View control. |
| Column Details | In the Alarm Client Control, you can configure the column details directly on the **Column Details** page. |
| Show Grid | In the Alarm Client Control, you can configure the **Show Grid** option on the **Run-Time Behavior** page. |
| Show Heading | In the Alarm Client Control, you can configure the **Show Heading** option on the **Run-Time Behavior** page. |
| Row Selection | In the Alarm Client Control, this option is called **Row Selection**. You can configure it on the **Run-Time Behavior** page. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| InTouch option | Alarm Control option |
|---|---|
| Resize Column | In the Alarm Client Control, this option is called **Allow Column Resizing**. You can configure it on the **Run-Time Behavior** page. |
| Show Status Bar | In the Alarm Client Control, you can configure the **Show Status Bar** option on the **Run-Time Behavior** page. |
| Retrieve Buttons | In the Alarm Client Control, the retrieve buttons are not available. The underlying grid technology handles the alarm retrieval from the alarm database. |
| Silent Mode | In the Alarm Client Control, this option is called **Hide Errors and Warnings**. You can configure it on the **Run-Time Behavior** page. |
| Font | You can configure this option from the Industrial Graphic Editor page. Select the Alarm Client Control on the canvas and select an appropriate font type, size, and style on the menu bars. |
| Show Message | In the Alarm Client Control, this option is called **Show Custom 'No Records' Message**. You can configure it on the **Run-Time Behavior** page. |

### Transferring Configuration of the InTouch Alarm DB View Color Tab

You can transfer the configuration of the **Color** tab options of the InTouch Alarm DB View control to the Alarm Client Control.




All the options of the **Color** tab in the InTouch Alarm DB View control can be set on the **Colors** page of the Alarm Client Control.

The following table shows you some minor differences in wording:

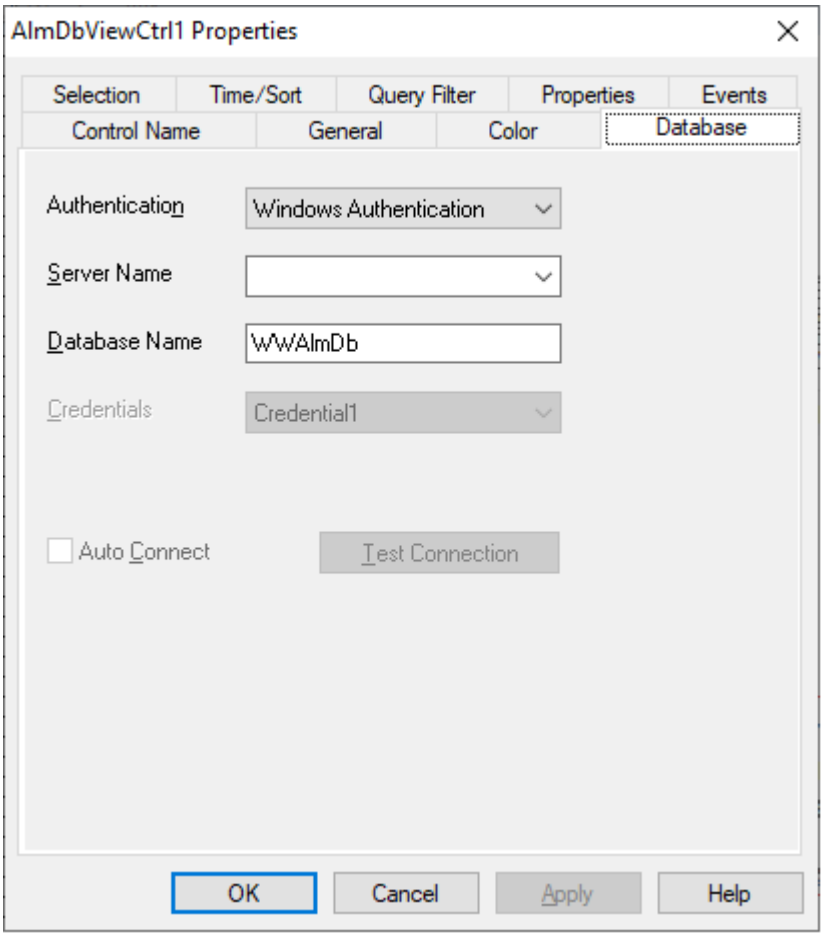
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| InTouch Alarm DB View control | Alarm Client Control |
|---|---|
| Forecolor | Text |
| Backcolor | Background |
| Alm | n/a |
| Return | RTN |

You can set the alarm priority range breakpoints directly in the table in the **From Pri** column.

### Transferring Configuration of the Database Tab

You can transfer the configuration of the **Database** tab options of the InTouch Alarm DB View control to the Alarm Client Control.




In the Alarm Client Control, you can configure the following options on the **Alarm Mode** page:

- **Server Name**
- **Database Name**
- **User**
- **Password**
- **Credentials**
- **Test Connection**

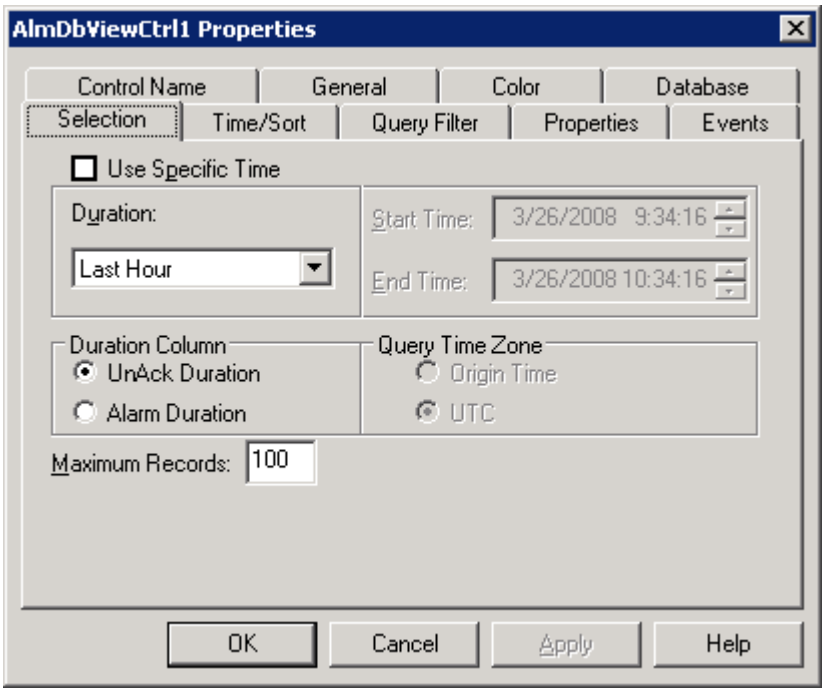
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

In the Alarm Client Control, the **Auto Connect** option is called **Query on Startup**. You can configure it on the **Run-Time Behavior** page.

The configuration for the Alarm Database only appears if the **Client Mode** is set to **Historical Alarms**, **Historical Events**, or **Historical Alarms and Events**.

### Transferring Configuration of the Selection Tab

You can transfer the configuration of the **Selection** tab options of the InTouch Alarm DB View control to the Alarm Client Control.



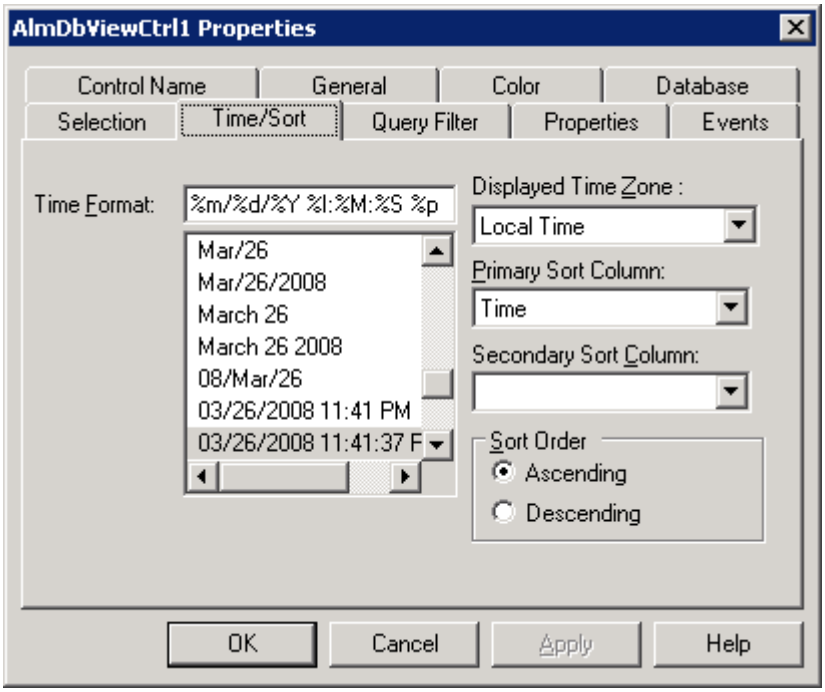

| InTouch option | Alarm Control option |
|---|---|
| Use Specific Time, Start Time, End Time | In the Alarm Client Control, you can set these options directly in the Time Range Picker control on the **Alarm Mode** page.<br><br>When you select a time from either the start time or end time part of the Time Range Picker control, the Alarm Control is automatically set to use a specific time.<br><br>To keep the specific start and end time, you must also clear **Update to Current Time**. When you refresh the Alarm Control grid at run time, the time range stays fixed to the given start and end time. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| InTouch option | Alarm Control option |
|---|---|
| Duration | In the Alarm Client Control, you can set this option directly in the Time Range Picker control on the **Alarm Mode** page.<br><br>When you select a duration from the center part of the Time Range Picker control, the Alarm Control is automatically set to use a time offset.<br><br>To keep the duration, you must also select the **Update to Current Time** check box.<br>When you refresh the Alarm Control grid at run time, the end time is set to the current time and the Alarm Control shows the alarms within the set duration. |
| UnAck Duration, Alarm Duration | In the Alarm Client Control, you cannot configure the Unack Duration and Alarm Duration settings. The Alarm Control grid shows both UnAck Duration and Alarm Duration in separate columns. |
| Query Time Zone | In the Alarm Client Control, you can configure the **Time Zone** setting on the **Time Settings** page. |
| Maximum Records | In the Alarm Client Control, you can configure the **Maximum Records** setting on the **Alarm Mode** page. |

### Transferring Configuration of the Time/Sort Tab

You can transfer the configuration of the **Time/Sort** tab options of the InTouch Alarm DB View control to the Alarm Client Control.

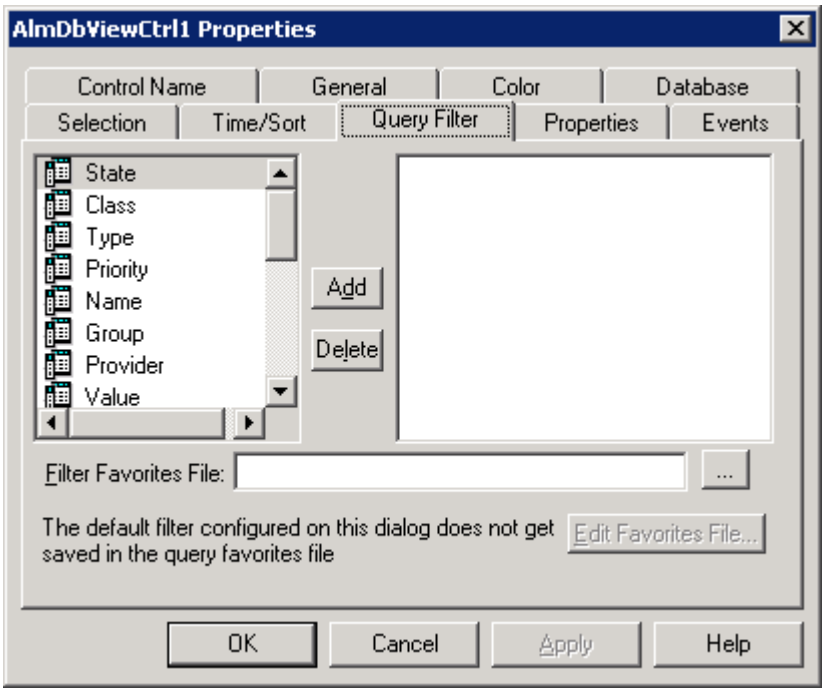



© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| InTouch option | Alarm Control option |
|---|---|
| Time Format | In the Alarm Client Control, you can configure the **Time Format** setting on the **Time Settings** page. |
| Displayed Time Zone | In the Alarm Client Control, you can configure the **Time Zone** setting on the **Time Settings** page. |
| Primary Sort Column, Secondary Sort Column, Sort Order | In the Alarm Client Control, you can configure the sorting options on the **Column Details** page. |

### Transferring Configuration of the Query Filter Tab

You can transfer the configuration of the **Query Filter** tab options of the InTouch Alarm DB View control to the Alarm Client Control.

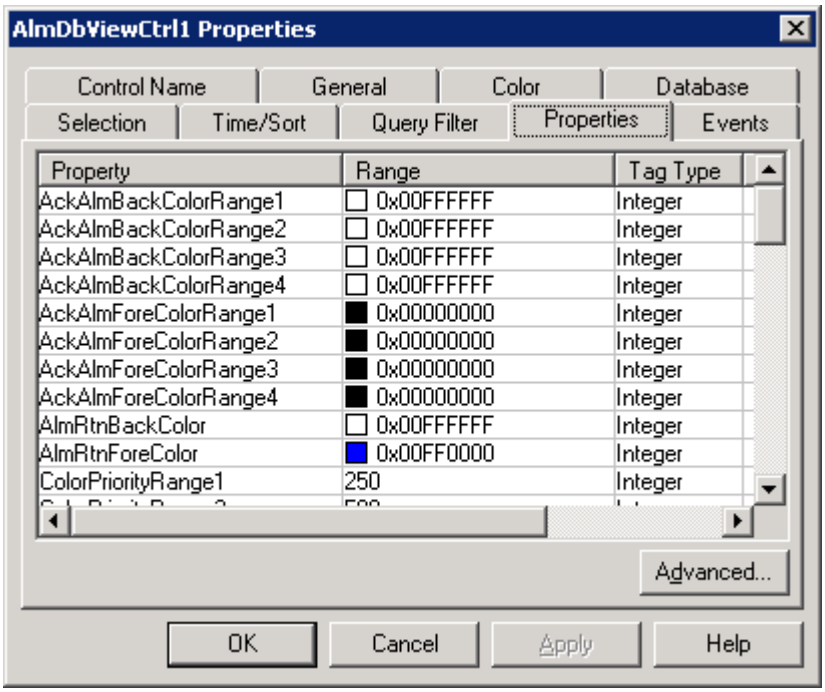



In the Alarm Client Control, all query favorites and filter favorites are managed on one page and are interchangeable between different client modes. To access the Query Filter Favorites, open the **Query Filters** page.

### Transferring Configuration of the InTouch Alarm DB View Properties Tab

You can set the properties of the Alarm Client Control in the **Properties Editor** when the Alarm Control is selected on the canvas.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




For more information on the exact mapping between the InTouch Alarm DB View control properties and Alarm Client Control properties, see Mapping Properties and Methods.

The advanced property filtering feature does not exist in the Alarm Client Control. However, when you browse for properties of the Alarm Client Control from other elements with the **Galaxy Browser**, you can filter the properties. Also, the properties of the Alarm Client Control are logically grouped in the Properties Editor.

### Transferring Scripts Configuration on the Events Tab

You can configure scripts for events of the Alarm Client Control on the **Event** animation page. The events are the same as the events for the InTouch Alarm DB View control:

- Click
- DoubleClick
- NewAlarm
- Shutdown
- StartUp

For more information, see Configuring Events.

## Transferring Query Favorites Configuration

You can only transfer query favorites configuration from InTouch to the Alarm Client Control by recreating the filters on the Query Filters page.

If you intend to use a the query filter in one of the current client modes, make sure you also include **Provider** and **Group** as filter criteria.

## Mapping Properties and Methods

The following table shows all properties and methods of the InTouch Alarm Viewer control and InTouch Alarm DB View controls and their corresponding properties and methods of the Alarm Client Control.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| InTouch alarm control | property or method |
|---|---|
| DisplayedTimeZone | TimeZone.TimeZone Property |
| DisplayMode | ClientMode Property |
| Duration | TimeSelector.TimeDuration Property |
| EndTime | TimeSelector.EndDate Property |
| EventBackColor | EventColor.BackGround Property |
| EventColor | EventColor.ForeGround Property |
| EventForeColor | EventColor.ForeGround Property |
| ExtendedSelection | RowSelection Property |
| FilterFavoritesFile | No corresponding property. The file name is used as a parameter for the Favorites.Export() Method and Favorites.Import() Method methods. |
| FilterMenu | ContextMenu.Favorites Property |
| FilterName | Favorite Property |
| FlashUnackAlarms | FlashUnAckAlarms Property |
| FlashUnAckAlmColorRange1 | AlarmColor.UnAck.Flash.ForeGround Property |
| FlashUnAckAlmColorRange2 | AlarmColor.UnAck.Flash.ForeGround Property |
| FlashUnAckAlmColorRange3 | AlarmColor.UnAck.Flash.ForeGround Property |
| FlashUnAckAlmColorRange4 | AlarmColor.UnAck.Flash.ForeGround Property |
| Font | You can only set the font at design time, not at run time. |
| FreezeDisplay() | FreezeDisplay() Method |
| FreezeMenu | ContextMenu.Freeze Property |
| FromPriority | No corresponding property. Configure a Query Filter favorite at design time instead and use the Favorite property. For more information, see Favorite Property. |
| GetItem() | GetItem() Method |
| GetLastError() | GetLastError() Method |
| GetNext() | No corresponding property. Alarm records are retrieved one by one from the Alarm Database after the initial set of alarm records is retrieved. The initial set is defined by the **Maximum Records** setting. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| GetPrevious() | No corresponding property. Alarm records are retrieved one by one from the Alarm Database after the initial set of alarm records is retrieved. The initial set is defined by the **Maximum Records** setting. |
| GetSelectedItem() | GetSelectedItem() Method |
| GridColor | GridColor Property |
| GroupExactMatch | No corresponding property. Configure a Query Filter favorite at design time instead and use the Favorite property. For more information, see Favorite Property. |
| GroupName | No corresponding property. Configure a Query Filter favorite at design time instead and use the Favorite property. For more information, see Favorite Property. |
| MaxRecords | MaxDatabaseRecords Property |
| MoveWindow() | MoveWindow() Method |
| NewAlarmEventMode | NewAlarmEventMode Property |
| Password | Database.Authentication Property |
| PrimarySort | SortOrder.First Property |
| ProviderExactMatch | No corresponding property. Configure a Query Filter favorite at design time instead and use the Favorite property. For more information, see Favorite Property. |
| ProviderName | No corresponding property. Configure a Query Filter favorite at design time instead and use the Favorite property. For more information, see Favorite Property. |
| QueryFavoritesFile | No corresponding property. The file name is used as a parameter for the Favorites.Export() Method and Favorites.Import() Method methods. |
| QueryFavoritesMenu | ContextMenu.Favorites Property |
| QueryName | Favorite Property |
| QueryStartup | QueryStartup Property |
| QueryTimeZone | TimeZone.TimeZone Property |
| QueryType | ClientMode Property |
| Refresh() | Requery() Method |
| RefreshMenu | ContextMenu.Requery Property |
| Requery() | Requery() Method |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| RequeryMenu | ContextMenu.Requery Property |
| Reset() | Reset() Method |
| ResetMenu | ContextMenu.Reset Property |
| RetainSuppression | RetainHidden Property |
| RowCount | RowCount Property |
| RowSelection | RowSelection Property |
| SecondarySort | SortColumn.Second Property |
| SecondarySortColumn | SortColumn.Second Property |
| SelectAll() | To select all records, see Select.All() Method.<br>To reverse the selection of all records, see Toggle.All() Method. |
| SelectedCount | SelectedCount Property |
| SelectGroup() | Select.Group() Method |
| SelectItem() | To select a given alarm record, see Select.Item() Method.<br>To reverse the selection of a given alarm record, see Toggle.Item() Method. |
| SelectPriority() | Select.Priority() Method |
| SelectQuery() | Favorite Property |
| SelectTag() | Select.Tag() Method |
| ServerName | Database.ServerName Property |
| SetQueryByName | Favorite Property |
| SetSort() | SetSort() Method |
| ShowContext() | Show.Context() Method |
| ShowContextMenu | ShowContextMenu Property |
| ShowDate | There is no equivalent functionality in the Alarm Client Control. |
| ShowFetch | No corresponding property. The buttons for retrieving sets of alarm records from the Alarm Database do not exist in the Alarm Client Control. |
| ShowFilter() | Show.Favorite() Method |
| ShowGrid | ShowGrid Property |
| ShowHeading | ShowHeading Property |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| ShowMessage | NoRecordsMessage.Enabled Property |
| ShowQueryFavorites() | Show.Favorite() Method |
| ShowSort() | Show.Sort() Method |
| ShowStatistics() | Show.Statistics() Method |
| ShowStatusBar | ShowStatusBar Property |
| ShowSuppression() | Show.Hidden() Method |
| SilentMode | HideErrors Property |
| SortColumn | You can set three sort columns in the Alarm Client Control. To set the first column, see SortColumn.First Property. |
| SortMenu | ContextMenu.Sort Property |
| SortOnCol() | To set the first sort column, see SortColumn.First Property. To set the sort order of the first sort column, see SortOrder.First Property. |
| SortOrder | SortOrder.First Property |
| SpecificTime | UpdateToCurrentTime Property |
| StartTime | TimeSelector.EndDate Property |
| StatsMenu | ContextMenu.Statistics Property |
| SuppressAll() | Hide.All() Method |
| SuppressAllMenu | ContextMenu.HideAll Property |
| SuppressedAlarms | HiddenAlarms Property |
| SuppressGroup() | Hide.Group() Method |
| SuppressionMenu | ContextMenu.Hidden Property |
| SuppressOthersMenu | ContextMenu.HideOthers Property |
| SuppressPriority() | Hide.Priority() Method |
| SuppressSelected() | Hide.Selected() Method |
| SuppressSelectedGroup() | Hide.SelectedGroup() Method |
| SuppressSelectedGroupsMenu | ContextMenu.HideSelectedGroups Property |
| SuppressSelectedMenu | ContextMenu.HideSelected Property |
| SuppressSelectedPrioritiesMenu | ContextMenu.HideSelectedPriorities Property |
| SuppressSelectedPriority() | Hide.SelectedPriority() Method |
| SuppressSelectedTagsMenu | ContextMenu.HideSelectedTags Property |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| SuppressSelectedTag() | Hide.SelectedTag() Method |
| SuppressTag() | Hide.Tag() Method |
| SuppressVisible() | Hide.Visible() Method |
| SuppressVisibleMenu | ContextMenu.HideVisible Property |
| Time | Time.Type Property and Time.Format Property |
| TimeFormat | Time.Format Property and Time.Type Property |
| TitleBackColor | HeadingColor.BackGround Property |
| TitleForeColor | HeadingColor.ForeGround Property |
| ToPriority | No corresponding property. Configure a Query Filter favorite at design time instead and use the Favorite Property. For more information, see Favorite Property. |
| TotalAlarms | TotalRowCount Property |
| TotalRowCount | TotalRowCount Property |
| UnAckAlarms | UnAckAlarms Property |
| UnAckAlmBackColor | AlarmColor.UnAck.BackGround Property |
| UnAckAlmBackColorRange1 | AlarmColor.UnAck.BackGround Property |
| UnAckAlmBackColorRange2 | AlarmColor.UnAck.BackGround Property |
| UnAckAlmBackColorRange3 | AlarmColor.UnAck.BackGround Property |
| UnAckAlmBackColorRange4 | AlarmColor.UnAck.BackGround Property |
| UnAckAlmColorRange1 | AlarmColor.UnAck.ForeGround Property |
| UnAckAlmColorRange2 | AlarmColor.UnAck.ForeGround Property |
| UnAckAlmColorRange3 | AlarmColor.UnAck.ForeGround Property |
| UnAckAlmColorRange4 | AlarmColor.UnAck.ForeGround Property |
| UnAckAlmForeColor | AlarmColor.UnAck.ForeGround Property |
| UnAckAlmForeColorRange1 | AlarmColor.UnAck.ForeGround Property |
| UnAckAlmForeColorRange2 | AlarmColor.UnAck.ForeGround Property |
| UnAckAlmForeColorRange3 | AlarmColor.UnAck.ForeGround Property |
| UnAckAlmForeColorRange4 | AlarmColor.UnAck.ForeGround Property |
| UnAckOrAlarmDuration | No corresponding property. UnAck Duration and Alarm Duration are shown in the Alarm Control grid. |
| UnSelectAll() | UnSelectAll() Method |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| UnSuppressAll() | UnhideAll() Method |
| UnsuppressAllMenu | ContextMenu.UnhideAll Property |
| UseDefaultAckComment | AckComment.UseDefault Property |
| UserID | Database.UserID Property |
| Visible | Visible Property |
| WindowColor | WindowColor Property |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Chapter 17 The Trend Client

To use the Trend Client, you should already have a basic understanding of the Integrated Development Environment (IDE), the Industrial Graphic Editor, and the AVEVA InTouch HMI before continuing. For more information, see the documentation for each of these products.

## Understanding the Trend Client

Use the Trend Client to chart attribute current values from Application Server and tag current values from the InTouch HMI software. This differs from the trend feature in the InTouch HMI because Trend Client fully supports ArchestrA and can initialize a trend pen with data from a historical source such as InTouch LogHistory/LGH files or the Historian.

**Note:** The InTouch trends are still included as part of the InTouch HMI.

### Differences between the Trend Client Control and the Historian Client Trend Control

If you use the Historian Client Trend control, you need to be aware that there are several differences between the Trend Client Control and the Historian Client Trend control.

**Description of the Historian Client Trend Control**

AVEVA Historian Client Trend is a client application that allows you to query tags from a Historian database and plot them on a graphical display. The Historian Client Trend supports two different chart types: a regular trend curve and an XY scatter plot.

Before you can use the Historian Client Trend control to query tag information from the database, the Historian Server must be running and you must have the necessary access privileges.

**Description of the Trend Client Control**

In contrast to the Historian Client Trend control, the Trend Client Control:

- Includes the real-time as well as historical trending functionality.
- Uses the data from a historical source such as InTouch Log History (LGH) files or from the Historian.
- Has fewer pens.
- Uses real-time attribute or tag data as well as historized data stored in the Historian or InTouch Log History (LGH) files.
- Does not require a separate license from the Application Server.
- Requires the InTouch HMI.
- Only supports the full and cyclic retrieval modes of the Historian when retrieving data.
- Does not support configuring the default pen colors (although you can change them after you add a pen).
- Does not provide scatter plots and target regions.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Data Sources for the Trend Client

The Trend Client can use real-time data from Application Server and the InTouch HMI software and historical data from the Historian or InTouch LGH files. You identify the historical data source when you configure a pen. For more information, see Configuring Historical Sources.

At run time, the Trend Client initializes the trend with historical data from the data source (if configured) and then appends real-time data for the pens. If the pen is not associated with a historical data source, the trend initially shows no data. It then starts charting information as real-time data becomes available. If you refresh a pen configured with historical data, the chart re-queries the historical information, after which it appends the real-time data as it becomes available. Refreshing does not change a pen configured only for real-time data. If you refresh a trend that is charting both historical and real-time data, the historical information is recharted immediately, after which the trend charts real-time data as it becomes available.

The Trend Client supports the same syntax as the Industrial Graphics. It also supports the built-in functionality of the OwningObject property for trends configured with relative naming. For information about Industrial Graphics data configuration syntax and OwningObject functionality, see the Creating and Managing Industrial Graphics User Guide. For more information on relative and absolute references, see the Application Server User Guide.

There are primary settings for specifying the time period you want to plot, such as a relative reference (the preceding two hours), or an absolute reference (July 15th at 10am for 2 hours) using scripting.

As an example, suppose you opened two trends created with the Trend Client. Both of them have a duration of 15 minutes, but the first one is only trending real-time data (meaning that the pen is associated with an expression but not with a historical tag) and the second is trending historical data (meaning that the pen is associated with both an expression and a historical tag). If you open both of these trends at the same time, what you see is described in the following table.

| Time after starting both trends | What you see |
|---|---|
| 0 minutes | The first trend shows no data. The second trend shows 15 minutes of historical data from the source. |
| 5 minutes | The first trend shows 5 minutes of real-time data. The second trend shows 10 minutes of the historical data and 5 minutes of real-time data. |
| 15 minutes | Both charts show 15 minutes of real-time data. All the historical data will have been pushed off the second trend by the new real-time data. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Configuring the Trend Client

This section shows you how to place a Trend Client on the canvas and configure it. You can configure it either with the **Edit Animations** dialog box, or by changing individual properties in the Properties Editor

## Placing the Trend Client into an Industrial Graphic

You can easily place the Trend Client into an Industrial Graphic by placing it onto the canvas.

**To place the Trend Client into an Industrial Graphic**

1. Open the Industrial Graphic.



2. On the **Tools** panel, click the **Trend Client** icon. The cursor appears in insert mode.
3. Click on the canvas where you want to place the upper left corner of the Trend Client.

## Removing the Trend Client from an Industrial Graphic

You can remove the Trend Client from the canvas.

**To remove the Trend Client from an Industrial Graphic**

1. Open the symbol you want to remove the Trend Client from.
2. Do either of the following:
   - Select the Trend Client and press **Delete**.
   - Right-click the Trend Client and select **Delete** from the menu.

## Validating the Configuration of the Trend Client

You can validate the configuration of a Trend Client. If the configuration has an error, an exclamation mark appears next to the **Animation** icon.

Examples of errors include:

- Syntax errors in expressions
- Data type mismatches
- Required values not specified
- Specified values out of valid range

**To validate the configuration of a Trend Client**

1. Open the symbol containing the Trend Client.
2. Double-click the Trend Client. The **Edit Animations** dialog box appears.
3. Click the **Validate** icon on the right side of the **Edit Animations** dialog box.



© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

The Trend Client is validated. Possible errors are highlighted in the right side of the dialog box.

## Clearing the Configuration from the Trend Client

You can clear all configuration data from the configuration boxes of and reset the settings to the defaults.

**To clear all configuration data**

- In the configuration panel, click the **Clear animation** icon.

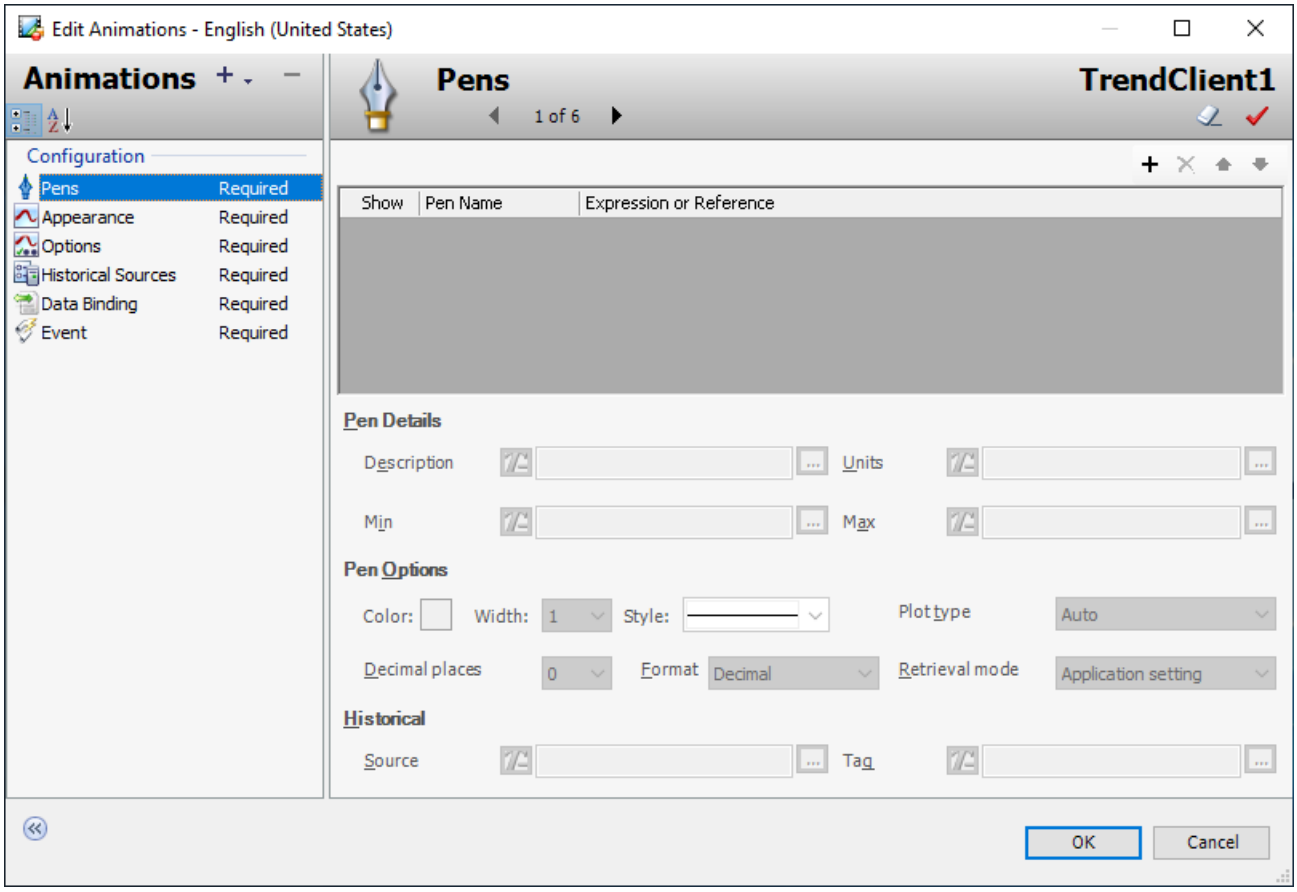


## Adding a Pen

When you first add a Trend Client to the canvas, no pens are defined. To show a trend, you must add at least one pen and configure it so that the system can identify what trend information to chart. Each pen must have an associated expression or reference.

**To add a pen**

1. In the Industrial Graphic Editor, double-click the Trend Client. The **Edit Animations** dialog box appears with the pen configuration information in the right pane.

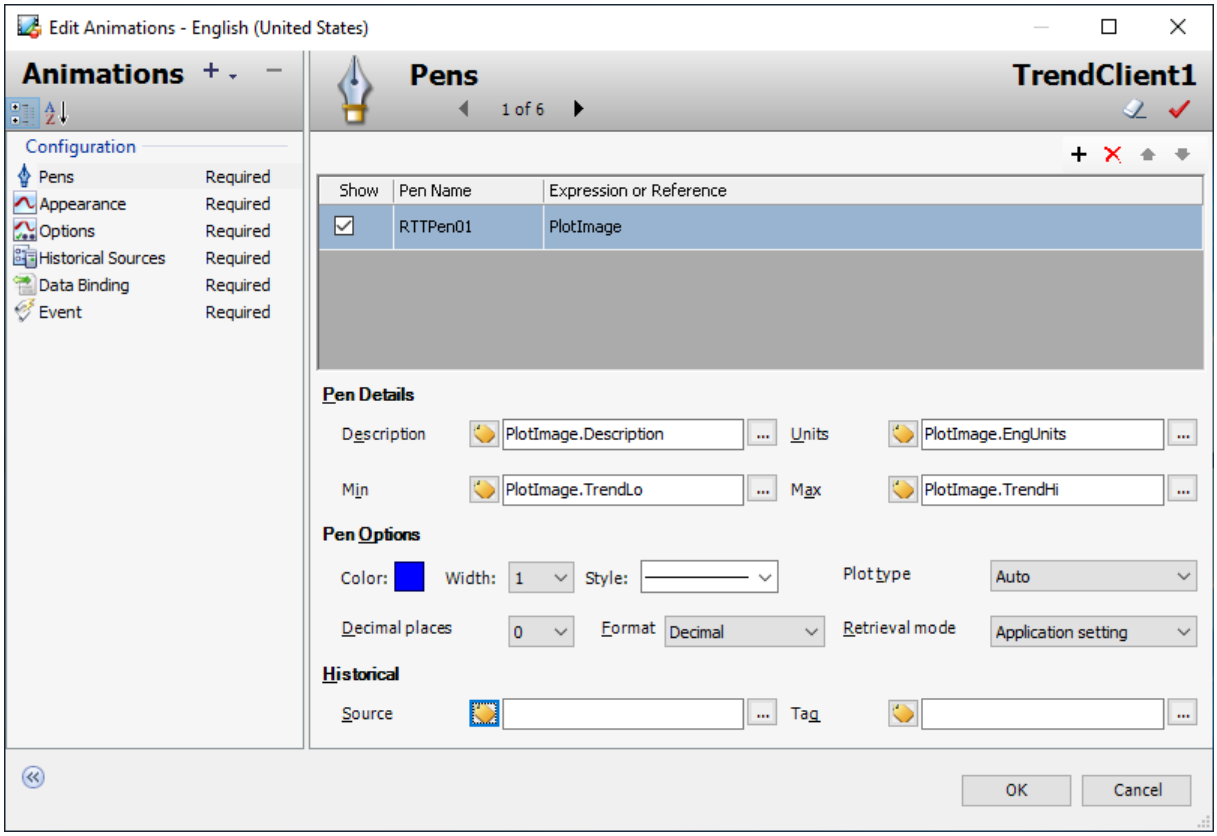



2. Click the **Add** icon on the right side of the **Edit Animations** dialog box.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.



A new pen appears in the configuration panel.

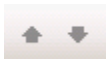



3. In the row for the pen, configure the information for the new pen.

| | |
|---|---|
| **Show** | Select the Show box to show the pen in the trend. |
| **Pen Name** | Type the name of the pen. (If you leave this blank, the pen's expression is used as the chart label.) |
| **Expression or Reference** | Type an expression or reference. Click the ellipsis button to show the Galaxy Browser. |

### To reorder pens

- Click the Up/Down icons to reorder the pens you have added.



## Connecting a Pen to an InTouch Tag

You can connect the pen to an InTouch tagname through the **Expression or Reference** box. The InTouch tagname provides values at run time that control the animation and appearance of the pen.

This can be done by:

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- Configuring a reference with the **intouch:tagname** syntax.
- Using a custom property and configuring the custom property in the embedded Industrial graphic in InTouch to reference an InTouch tag. For more information, see the InTouch HMI and ArchestrA Integration Guide.
- Configuring an application server attribute reference to the managed InTouchViewApp object that contains the InTouch tagnames as attributes. The InTouchViewApp object uses the functionality of an InTouchProxy object.
- Configuring an application server attribute reference to an InTouchProxy object that contains the InTouch tagnames as items. This is a special case of configuring an application server attribute reference.

To be able to browse for InTouch tags, you must first:

- Create a managed InTouch application by deriving an InTouchViewApp template and configuring it in WindowMaker.
- Derive an instance of the InTouchViewApp derived template.

The InTouch tags are represented by attributes of the InTouchViewApp object instance.

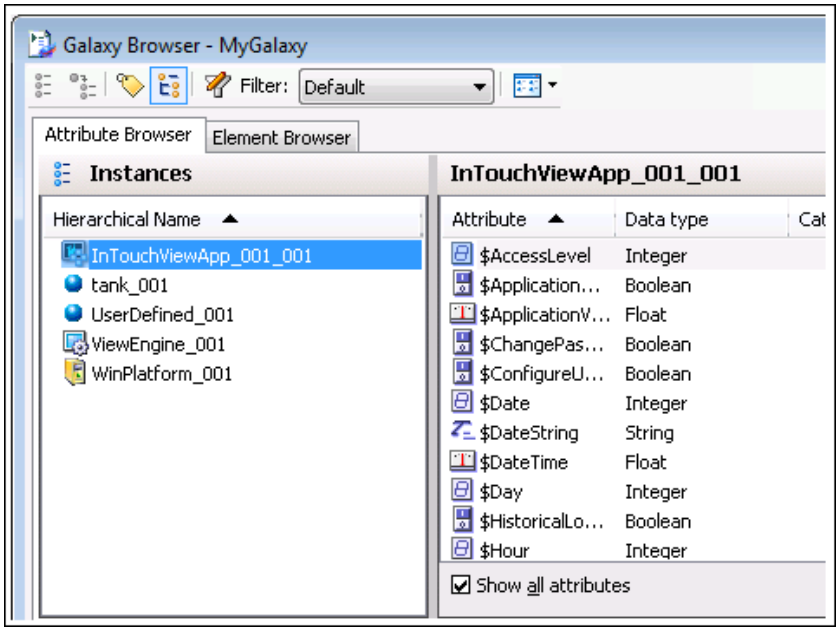
You may not always be able to reference the local node if you use this method of connecting to the InTouch HMI software. As a result, you may have problems with some applications. If this is the case, use the **intouch:tagname** syntax.

With the **intouch:tagname** syntax, the pen connects to the InTouch tag on the symbol's node. There are some restrictions on how you can use this syntax:

- Unlike in Application Server, you cannot use TRUE and FALSE as Boolean values. Use 1 and 0 instead.
- If you want to connect to an InTouch SuperTag with this syntax, use the following syntax instead: `attribute("intouch:SuperTag\Member")`

### To connect Trend Client to InTouch tags

1. In the Galaxy Browser, select the InTouchViewApp object that corresponds to the managed InTouch application. The right panel shows the InTouch tags.




© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

2. Select a tag and click **OK**. The selected reference to an InTouch tag appears in **Expression or Reference**.

### Configuring Pen Details and Options

After you add a pen and configure the expression or reference for the pen(s), you can set details and options for how the pen shows information on the trend chart. Pen details include the description, units, minimum and maximum for the pen. Pen options include the pen color, width, style, plot type, number of decimal places, format, and retrieval mode.

The default values for the pen details are formed by appending **.Description**, **.EngUnits**, **.TrendLo**, and **.TrendHi** to the pen expression. For example, if the pen expression is **Me.PV** for a field attribute named **PV** created on the user defined object, the default pen details are **Me.PV.Description**, **Me.PV.EngUnits**, **Me.PV.TrendLo**, and **Me.PV.TrendHi**. These are generally the best expressions to use for historized attributes. (If the expression is empty or invalid, the Trend Client uses default values of 0 and 100 for the minimum and maximum at run time.)

---

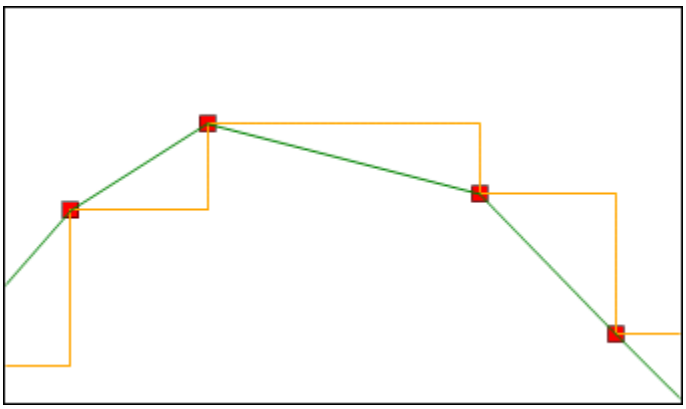
**Note:** For some input boxes on the configuration screens, you can specify if the configuration is a static value or a reference by setting the input mode. An input mode icon appears to the left of these boxes. Use static mode input to specify a literal static value such as "Temperature" or 3.141. Use reference mode to specify a reference to an attribute or symbol property such as Tank_001.PV. You can enclose static string values with double-quotes (such as "Description:" or "+Tank_001.Desc") with or without references in Reference mode. When you are in reference mode, you can also click the ellipsis button to the right of the box to show a selection tool such as the Galaxy Browser or the Tag Picker.

---

A line curve (plot type **Line**) is best suited for charting continuously-changing analog data. A step-line curve (plot type **Step**) is best suited for discrete data and box for analog data that is not continuous. When you select a plot type of **Auto**, the curve type is determined as follows:

- For tags retrieved from Historian 9.0 (or higher), the type is based on the tag's effective interpolation setting. Tags that use stair-step interpolation are trended as a step line, and tags that use linear interpolation are trended as a line.
- For all other tags, the curve type is based on the tag type: step line for integer tags, and line for real tags.

The following illustration shows the same data drawn using each type of curve. The line curve is shown in green, the step line curve is shown in orange, and the point curve is shown in red.



#### To configure the options for a pen

1. Select the pen you want to configure.
2. In the **Pen Details** area, configure what the pen shows.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| **Description** | The pen’s description. The expression is evaluated and the result is used for the pen's description in the pen list (the legend) below the chart itself. |
| **Units** | The unit to chart in. This is the plot scale, rather than an instrument scaled from a percentage to engineering units. |
| **Min** | Type the minimum for the pen’s range. |
| **Max** | Type the maximum for the pen’s range. |

3. In the **Pen Options** area, configure how the curve looks in the chart for the selected pen.

| | |
|---|---|
| **Color** | The line color of the pen. Click the colored square to select the color from a palette or define a custom color. |
| **Width** | The thickness of the trend curve. Valid values are 0 through 10. |
| **Style** | The style of the trend curve; for example, a solid or dashed line. |
| **Plot type** | The type of trend curve to draw. Options are **Line**, **Step line**, **Point**, and **Auto**. |
| **Decimal Places** | The number of decimal places to show for the data value. This applies only to analog tags. Valid values are 0 through 15. |
| **Format** | The way the values for the pen appear, either in decimal format or scientific format. |
| **Retrieval Mode** | The data retrieval mode, either **Cyclic**, **Full**, or **Application Setting**. |

### Configuring Pens for Historical Sources and Tags

When you start the Trend Client at run time with historical data and then plotting real-time data, you can configure a pen to initialize with a specific historical source and tag. For example, MyEngine.Engine.Historian.Connection is a common relative reference expression for the historical source on a template and, for a pen expression of Me.PV, Me.TagName.PV is a common relative reference expression for the historical tag.

If the historical tagname needs to use relative references, construct the string expression for the historical tagname that evaluates the relative part of the name and append a static part. For example, to reference a UDA named PV, use Me.Tagname+".PV" or a similar expression. You can define this expression on a symbol in a $Reactor template. There are instances of Historian tagnames are Reactor1.PV and Reactor2.PV. If you use the expression in the form Me.PV, it resolves to the current value instead of the tagname. For example, if PV is associated with a temperature, Me.PV would return a temperature rather than the string for the tagname.

You can also use valid relative references such as Me, MyContainer, MyArea, MyEngine, and MyPlatform when configuring the historical tag-names as relative references. For example, to reference the UDA named "Level" in a

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

user-defined object named $Reactor, you can configure the historical tagname as an expression: Me.TagName+".Level". At run time, when the object "Reactor_001" is viewed, the expression is resolved to "Reactor_001.Level" as the historical tag name.

### To configure a pen for a historical source and tag

1. Select the pen you want to configure.
2. In the **Historical** area, configure the source and tag for the pen.

| | |
|---|---|
| **Source** | The historical source to use for the pen. This history source must already be configured in the **Historical Sources** pane. For more information, see "Configuring Historical Sources".<br><br>If this is set to reference mode, click the ellipsis button to show the Galaxy Browser and use that to find the expression or reference. |
| **Tag** | The historical tag to use for the pen. If this is set to reference mode, click the ellipsis button to show the Tag Picker. For more information, see "Using the Tag Picker". |

**Note:** To use the reference mode, you must have already configured a historical data source for the Trend Client. For more information, see "Configuring Historical Sources".

## Configuring Historical Sources

To use a Trend Client to chart historical data, you must connect to a data source. You can connect to a Historian or an InTouch LGH file.

You can use one of the following authentication modes when connecting to AVEVA Historian:

- Windows Integrated Security (uses the running process credentials)
- Alternate Windows account (You can use the credentials stored in the Credential Manager. You can also specify the domain name, user name, and password).

  The alternate credentials are used to do a Windows impersonation before connecting to the database using Windows Integrated Security.
- SQL Server Authentication

  You can use the credentials stored in the Credential Manager. You specify the user name and password of a SQL Server account. These credentials are used to log in to the database.

**Note:** Ask your administrator what type of user account you must use to access the server.

Server connections are specific to the instance of the client and must be re-defined for each instance.

When you start a Application Server application, you are not automatically logged on to every server that you configured before. You are only logged on to a server when a pen is configured to use that server.

You need not run as an administrative user to operate in run time within an InTouch application. The user access control is enabled for you on all supported Windows operating systems.

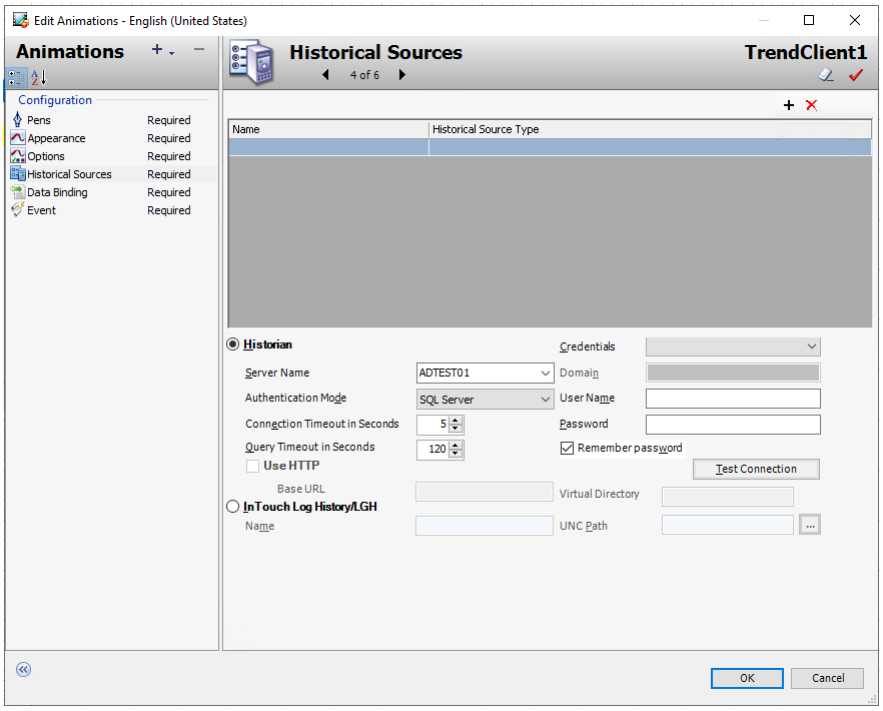
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

## Creating a Historian Connection

To create a Historian connection, you need your assigned Historian user name and password.

### To create a Historian connection

1. In the Industrial Graphic Editor, double-click the Trend Client. The **Edit Animations** dialog box appears
2. Click **Historical Sources**. The **Historical Sources** screen appears in the right pane.




3. Click the **Add** icon on the right side of the **Edit Animations** dialog box.

   A new server row appears in the configuration panel.
4. In **Server Name**, type the name of the server to which you want to connect. You can select from a list of the servers by clicking the arrow to the right of the box.
5. In **Authentication Mode**, select one of the following authentication modes: Windows Integrated, Windows Account, or SQL Server.
   - Windows Integrated to use the authentication of the currently logged-on Windows user
   - Windows Account to use a given Windows user authentication
   - SQL Server to use SQL Server authentication mode
6. From the **Credentials** drop-down, select the credentials for authentication.The Credentials field is enabled only when you select **Windows account** or **SQL Server** authentication type. The Windows Integrated authentication method uses the credentials of the user currently logged in, and disables the Credentials field.

**Note:**

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- For standalone InTouch applications, the credentials are retrieved from the Application Manager. For managed InTouch applications, the credentials are retrieved from the Credential Manager of the Application Server. For more information, see Work with Credential Manager in the AVEVA™ InTouch HMI Application Development Guide.

- By default, all named credentials are added to the Administrators group. In addition, we recommend you to add groups that the users running the application belong. This will allow the users to access the credentials even when running the application in a non-administrator mode, such as, viewing the historical data or trends in WindowViewer.

You can also select **Use username and password** to enter the credentials.

- If you are using Windows Account authentication mode, type the domain, user name, and password in the Domain, User Name and Password boxes.
- If you are using SQL Server authentication mode, type user name and password in the User Name and Password boxes.

where:

Domain - The domain name in which your Windows account is validated.

If you are logging on to the server using Windows Account or SQL Server credentials, configure the following login details:

User Name - Your assigned Historian user name. If your system administrator has not assigned you a user name and password, you may use one of the default user accounts, which are automatically configured during a typical Historian installation.

Password - The password that is associated with the user name. Select **Remember password** to have the system remember your password.

7. In **Connection Timeout in Seconds**, type the connection timeout in seconds. Valid values are 1 to 600.
1. In **Query Timeout in Seconds**, type the query timeout in seconds. Valid values are 1 to 600.

   **Note:** You can test the connection to the server with the information you have entered by clicking **Test Connection**. If necessary, you can edit the information before adding the server to the list.

1. Click **OK**.

**Note:** The Trend Client does not validate the connection when you click OK.

## Creating an InTouch LGH Connection

You can get data from InTouch LGH files by connecting to them.

### To create an InTouch LGH connection

1. In the Industrial Graphic Editor, double-click the Trend Client. The **Edit Animations** dialog box appears
2. Click **Historical Sources**. The **Historical Sources** screen appears in the right pane.

3. Click the **Add** icon on the right side of the **Edit Animations** dialog box. A new connection entry appears in the configuration panel.
4. Select **InTouch Log History/LGH.**

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

5. In **Name**, type the InTouch HMI software server.
6. In **UNC Path,** type the location of the InTouch LGH file using a UNC path name or a mapped drive path.
7. Click **OK**.

**Note:** The Trend Client does not validate the connection when you click OK.

### Editing a Server Connection

You can edit an existing server connection.

#### To edit a server connection

1. On the **Historical Sources** screen, select the server you want to edit.
2. Edit the details for the server.
3. Click **OK**.

### Removing a Server Connection

You can remove a server connection you no longer need. After you delete a server, you cannot undelete it.

#### To remove a server connection

1. On the **Historical Sources** screen, select the server you want to delete.
2. Click the **Delete** icon on the right side of the **Edit Animations** dialog box.

   The server is deleted.

## Using the Tag Picker

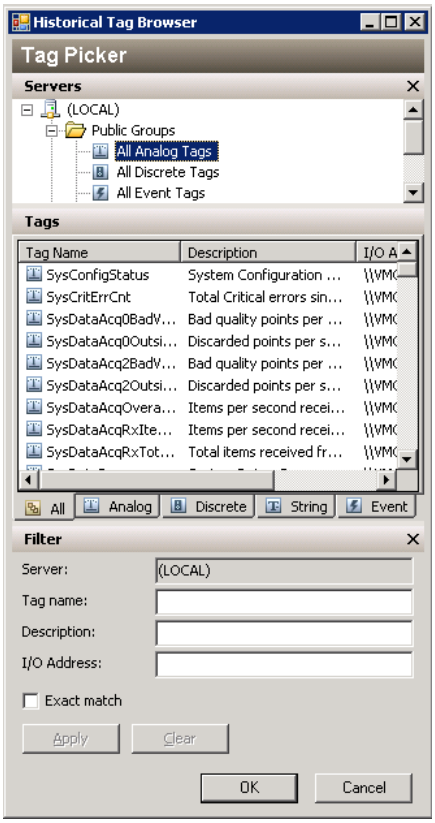
The Tag Picker shows which tag groups and tags exist in the Historian database. It shows all tags that are visible to the currently logged-on user based on his permissions.

Using the Tag Picker, you can quickly search the database for tags of a certain type or for tags that match a particular search pattern. You can then select the ones you want to include in the Trend Client. You cannot select a tag from an LGH file.

The Tag Picker includes the following panes:

- Servers pane
- Tags pane
- Filter pane

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




For instructions to import the Tag Picker control and embed it in a symbol, see "Chapter 12 Using Client Controls" of the *Creating and Managing Industrial Graphics User's Guide*.

## Using the Servers Pane

The **Servers** pane shows a list of Historian folders. The **Servers** pane allows you to navigate through the folder structure (namespace) of one or more Historians and select a group (folder) of tags.



The **Servers** pane shows the following items:

| Category | Description |
|---|---|
| Servers | All objects that make up the basic Historian system, such as tags, I/O Servers, defined engineering units, storage locations, and so on. |
| Public Groups | All objects that are visible to all clients. If you have administrative permissions, you can create, rename, and delete groups in the public groups folder. |
| Private Groups | All objects that are visible to the user that is currently logged on. Users can create, rename, and delete groups in the private groups folder. |

### Showing/Hiding the Servers Pane

#### To show the Servers pane

- Right-click in the **Servers** pane and then click **Servers pane** so that a check mark appears.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### To hide the Servers pane

Do one of the following:

- Right-click in the **Servers** pane and then click **Servers pane** so that no check mark appears.
- Click **Close**.

#### Adding a Group

You can add groups just as you would add a new folder in the Windows Explorer. For example, you can create the BoilerTags group under in the existing Private Groups group. You can also delete, cut, copy, paste, and drag objects from one folder to another.

### To add a group

1. Right-click on the folder under which you want to create a group and then click **New Group**.

   A new folder appears in the Tag Picker.

2. Type a name for the folder and press **ENTER**.

#### Adding a Tag to a Group

When you add tags to a new group, the original reference still appears in the default system group. Any tag can belong to any number of groups, and any group can contain any number of tags.

### To add a tag to a group

1. Select the system group folder that contains the tag that you want to add to your new group.
2. In the **Tags** pane, select the tag to add.
3. Do any of the following:
   - Drag the tag from the **Tags** pane into the folder.
   - Use the **Copy** and **Paste** commands on the **Edit** menu to copy the tag to the target folder.
   - Right-click on the tag in the **Tags** pane. Use the **Copy** and **Paste** commands in the shortcut menu to copy the tag to the target folder.

#### Deleting a Group or Tag Reference

When you delete a private group or a tag reference in a private group, the group folder, any subfolders that the group folder may contain, and all references to tags are deleted. The tags themselves are not deleted, and the original references still appear in the default system group. You cannot delete public folders or the tag references contained in them.

### To delete a group or tag

1. Select the group or tag in the pane.
2. Do one of the following:
   - Right-click on the group or tag and then click **DELETE**.
   - Press **DELETE**.

#### Renaming a Group

You can rename a group that you have created in the Tag Picker. However, you cannot rename a public folder.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### To rename a group

1. Select the group in the pane.
2. Do one of the following:
   - Right-click on the group and then click **RENAME**.
   - Press **F2**.
3. Type a new name for the group and press **ENTER**.

#### Viewing Server Details

You can view information such as the version number, time zone, and security mode for any Historian server in the **Servers** pane.

### To view server details

1. In the **Servers** pane, right-click on a Historian server and then click **Server details**. The **Server Details** dialog box appears.



2. Click **OK**.

## Using the Filter Pane

Use the **Filter** pane to reduce the tags listed in the **Tags** pane according to criteria that you specify. You can filter the tags according to name, description, and I/O address.



The filter mechanism allows for the following wildcard characters as part of the filter criteria:

| Wildcard Character | Filter Function |
|---|---|
| % | Any string of zero or more characters. |
| _ | Any single character. |
| [ ] | Any single character within the specified range or set. For example:<br>• [a-f]<br>• [abcdef] |
| [^] | Any single character not within the specified range or set. For example:<br>• [^a - f]<br>• [^abcdef] |

For example, to find all tagnames ending with "level", type **%level**. Filter criteria are not case-sensitive.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

When the **Servers** pane and the **Filter** pane are both visible, the filter conditions apply to the selected group in the **Servers** pane. When the **Servers** pane is hidden, the filter applies to all of the tags for the selected Historian.

**To apply a filter**

1. In the **Server** box, select the server.

   This box is not available if the **Servers** pane is visible.
2. In the **Tag name** box, type the string to match for the tagname.
3. In the **Description** box, type the string to match for the description.
4. In the **I/O Address** box, type the string to match for the I/O address.
5. Select the **Exact match** check box to search for tags that exactly match the entire string that you provided for the tagname and description options.
   For example, if you specify "level" as the tagname and do not select **Exact match**, any tagname that contains the string "level" appears. For example, "**ReactLevel**," "**ProdLevel**," and **"$AccessLevel**."

**Note:** The **Exact match** option does not apply to the I/O address.

1. Click **Apply** to apply the filter criteria.
2. Click **Clear** to clear the **Filter** pane.

## Using the Tags Pane

The **Tags** pane shows all the tags for the currently selected group in the **Servers** pane.



To select multiple tags in the list, hold **Ctrl** and/or **Shift** while clicking.

To view only tags of a certain type, click the appropriate tab at the bottom of the pane.

To sort the table by a particular column, click the column heading.

## Configuring the Trend Appearance

You can set a number of general options for the trend appearance, including gradients, border and plot area background color, highlights, and colors for the X and Y axes.

**To configure the trend appearance**

1. In the Industrial Graphic Editor, double-click the Trend Client. The **Edit Animations** dialog box appears
2. Click **Appearance**. The trend appearance information appears in the right pane.

   
3. Select **Single tag mode** to set the trend to single tag mode.

   When you initially create a tag list for a trend, all the tags are included in the display. Setting the trend to single tag mode allows you to exclude all tags but one from appearing in the trend chart, without removing them from the tag list.

   Clear **Single tag mode** to view multiple tags again in the chart.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

4. Click **Background color** to configure the main color of the background of the plot area. If you are using a gradient fill, this is the starting color for the gradient.
5. Click **End color** to select the ending color for the gradient. The gradient starts with the main color and fades to the gradient end color.
6. Click **Type** to specify the starting point for the flow of the gradient. Valid values are **LeftRight**, **TopBottom**, **Center**, **DiagonalLeft**, **DiagonalRight**, **HorizontalCenter**, and **VerticalCenter**. For example, if you select green as main color, white as the gradient end color, and center as the gradient type, the center of the chart is green and fades to white towards the surrounding edges.
7. Click **Border Color** to configure the color of the border for the entire chart area.
8. Select **Allow highlight pen** to highlight the pen. Configure the color and width to be used for pen highlighting.

   **Highlight color** Click to select or configure a color for highlighting the pen curve.

   **Width** Specify the width (in pixels) of a highlighted curve.

9. In the **Grid** area, configure the grid options.

   **Show horizontal grid** Check to show the horizontal grid.

   **Show vertical grid** Check to show the vertical grid.

   **Color** Click to select or configure a color.

   **Width** The width, in pixels, of the border line.

   **Style** The style of the border line.

10. In the **X time axis** area, configure the properties for the horizontal axis.

    **Show horizontal cursor** Check to show the horizontal cursor.

    **Cursor 1 color** Click to select or configure the color for time axis cursor 1.

    **Width** The width of time axis cursor 1.

    **Style** The line style of time axis cursor 1.

    **Cursor 2 color** Click to select or configure the color for time axis cursor 2.

    **Width** The width of time axis cursor 2.

    **Style** The line style of time axis cursor 2.

    **Number of values** The number of values that are shown along the time axis. The values are shown at evenly-spaced points along the axis. The number of values remain the same even if you zoom in and out. The valid range is from 2 to 15, with a default of 6.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| **Grid lines per value** | The number of grid lines that appear between each pen value plotted on the chart. The valid range is from 1 to 20, with a default of 3. |
| **Label color** | The color of the X axis label. |

11. In the **Y value axis** area, configure the properties for the vertical axis.

| | |
|---|---|
| **Number of values** | The number of values that are shown along the value axis. The timestamps are shown at evenly-spaced points along the axis. The number of values remain the same even if you zoom in and out. The valid range is from 2 to 15, with a default of 6. |
| **Grid lines per value** | The number of grid lines appearing between each pen value that is plotted on the chart. The valid range is from 1 to 20, with a default of 2. |
| **Value axis label** | The label of the value axis. |

12. Click **OK**.

## Setting Chart Options

You can set a number of general chart options, including the trend background color, freeze options, refresh interval, and retrieval options.

### To set the chart options

1. In the Industrial Graphic Editor, double-click the Trend Client. The **Edit Animations** dialog box appears.
2. Click **Options**. The options information appears in the right pane.



3. Select the **Show pen selector** check box to show the legend or list of pens at the bottom the trend.
4. Click **Trend background color** to configure the main color of the background of the entire chart area.
5. Select **Show run-time context menu** to show the context menu when you right-click the trend at run time.
6. Set **Decimal Places** to the number of decimal places to use in the trend.
7. Set **Labels** to All to display the chart label, X and Y axis scales, and cursor information, or None to suppress the labels in the plot area
8. Select **Allow freeze/unfreeze trend update** to enable Freeze on the run-time context menu so you can freeze the trend chart from live updates. When this option is selected (the default), you can also set the freeze duration. The freeze duration determines how long the chart remains frozen when you freeze the chart at run time. After the freeze time has elapsed, the chart resumes the live updates. If the freeze duration is set to 0, you must manually unfreeze the chart.
9. Set **Refresh interval** to the number of seconds between chart updates. You can optionally select **Refresh entire chart** to refresh the entire chart after the number of refresh intervals you specify.

---

**Note:** Optimal performance for the Trend Client can be observed when, the default values for Refresh Interval is set at 1 second and Refresh entire chart every is set at 100 intervals. The Trend Client is refreshed as a

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

combination of both values and if the refresh rate is faster than the rate at which data is retrieved, data may not be plotted correctly.

1. Set **Retrieval Mode** to **Full** or **Cyclic**. Full retrieval mode returns all stored data points for a tag within a trend period. Cyclic retrieval mode returns stored data at equal length intervals within a trend period. For more information, see Appendix A, "Understanding Data Retrieval".

**Note:** Retrieval mode is applicable for tags from Historian. The value set here is the default setting for a pen; however, you can override it by setting the pen retrieval mode to any value other than application setting.

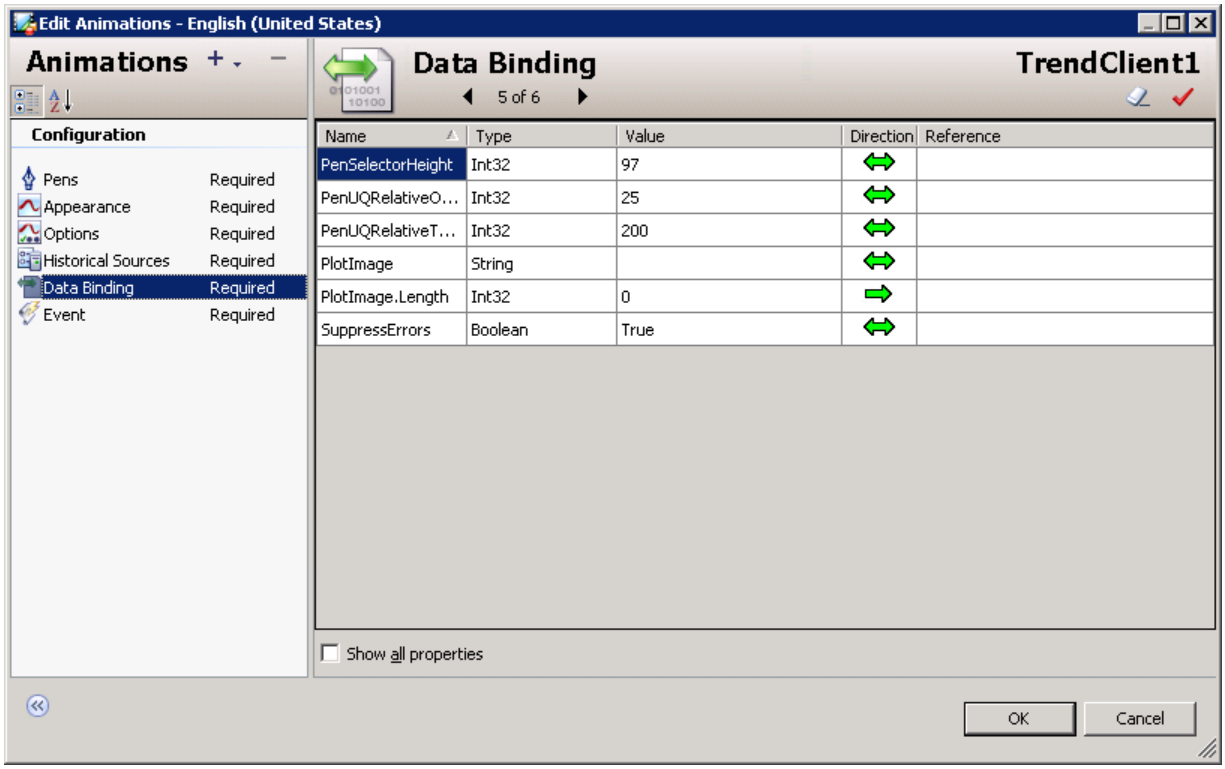
1. Set **Trend Duration**. You can set the trend duration for a maximum period of 2 years. All trend durations are calculated backward from an end date of the current time (except for the options "Yesterday" and "Previous Hour"). You can pick a duration from the list or type a specific duration in the list box. The time notation is [DD] HH:MM:SS.fff, where DD=days, HH=hours, MM=minutes, SS=seconds, and fff=milliseconds. To change a value in the duration list box, use the arrow keys on your keyboard to position the mouse cursor to the left of the number you want to change, and then type the new number. You can only change the duration and not the start and end time.
2. Click **OK**.

## Setting Data Bindings

You can associate a reference to an attribute with the Data Binding pane instead of with scripting. Information can be passed in either direction or both directions as desired. Changes to the status of one can affect the other.

### To set data bindings

1. In the Industrial Graphic Editor, double-click the Trend Client. The **Edit Animations** dialog box appears.
2. Click **Data Binding**. The data binding information appears in the right pane.




© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

The Data Binding table contains the following read-only information:

| | |
|---|---|
| **Name** | The name of the property. |
| **Type** | The .NET data type of the property. |
| **Value** | The value of the property. |

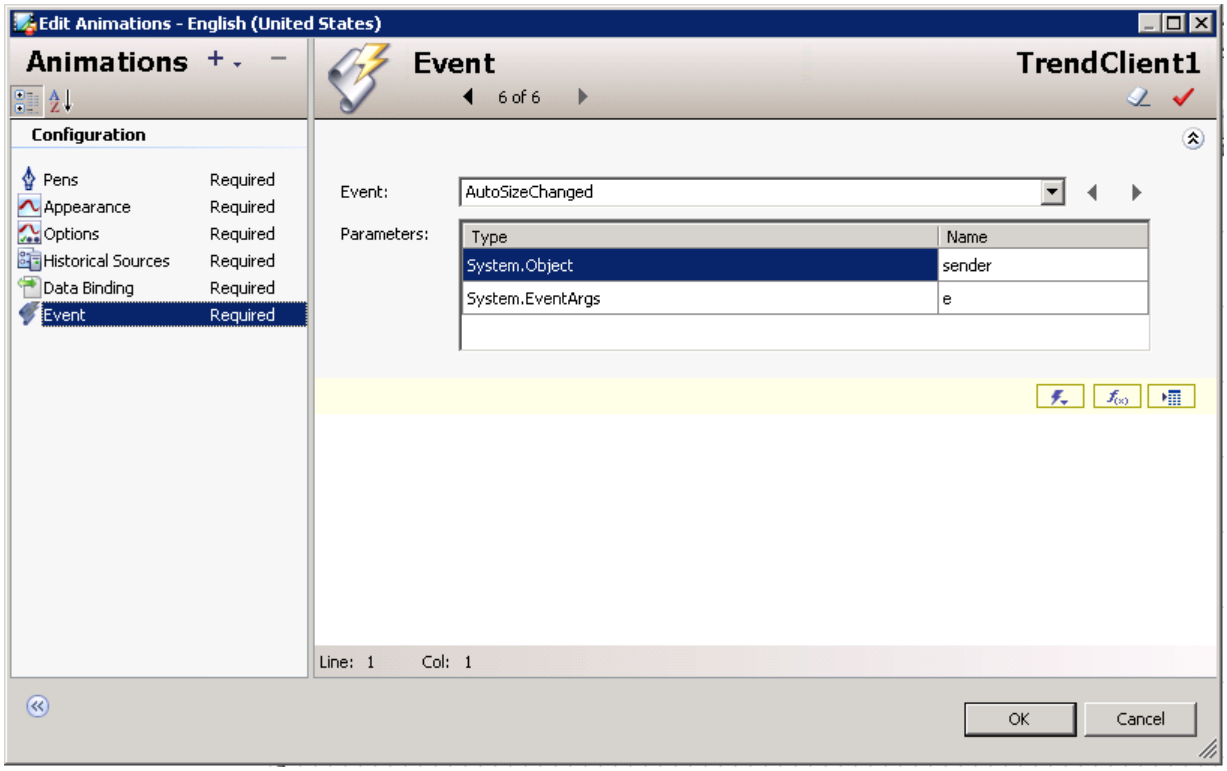
3. Click the **Direction** icon to disable the link entirely or change the direction of the data flow. If the arrow points to the right (away from the name of the property), the status of the Trend Client property affects the attribute you're binding to. If the arrow points to the left (toward the name of the event), the status of the Trend Client property is affected by the attribute you're binding to. If the arrow points both ways, a change in the status of one affects the other.
4. Double-click **Reference** to enter reference information. Click the ellipsis button to open the Galaxy Browser and use the Element Browser. For more information, see Chapter 3, Working with Objects, in the Application Server User Guide.
5. Select **Show all properties** to show all properties for which there is data binding information.
6. Click **OK**.

## Handling Trend Events

You can use the custom event editor to build scripts to handle trend events.

### To modify a trend event

1. In the Industrial Graphic Editor, double-click the Trend Client. The **Edit Animations** dialog box appears
2. Click **Events**. The events information appears in the right pane. For information on the different types of events, see Trend Client Events.




© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

3. Select an event in the **Event** list. The parameters information appears in the lower portion of the pane.
4. Type a script for this event in the window. You can use the editor buttons to gather information and parameters.

   Browse Event Parameters inserts the event parameters and any associated event parameter information at the current insertion point in the script.

   Display Script Function Browser shows the available script functions. Select a function and click **OK** to insert the function and parameters at the current insertion point in the script.

   Display Attribute Browser opens the Galaxy Browser.
5. Click **OK**. The script information is saved for the event.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Scripting the Trend Client

This section describes the properties, methods, and events for the Trend Client.

A Trend Client placed in a frame window supports panning and zooming. For more information on how to configure the ZoomPercent property, refer to the InTouch HMI Application Management and Extension Guide.

## Trend Client Properties

The following are the properties of the Trend Client:

- Chart.AddMultiplePens
- Chart.BackgroundColor
- Chart.Freeze
- Chart.FreezeDurationMS
- Chart.HidePenList
- Chart.Labels
- Chart.PenPrecision
- Chart.RefreshEntireChartIntervals
- Chart.RetrievalMode
- Chart.UpdateRateMS
- HistorySources
- Pen.Color
- Pen.Count
- Pen.Description
- Pen.Expression
- Pen.Format
- Pen.HistorySource
- Pen.HistoryTagName
- Pen.Index
- Pen.Name
- Pen.Precision
- Pen.RetrievalMode
- Pen.Style
- Pen.TrendHi
- Pen.TrendLo
- Pen.TrendType

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- Pen.Units
- Pen.Visible
- Pen.Width
- PenSelectorHeight
- PenUQRelativeOpacity
- PenUQRelativeThickness
- PlotArea.BackgroundColor
- PlotArea.BorderColor
- PlotArea.GradientEndColor
- PlotArea.GradientType
- PlotArea.GridColor
- PlotArea.GridHorizontal
- PlotArea.GridStyle
- PlotArea.GridVertical
- PlotArea.GridWidth
- PlotArea.HighlightCurrentPen
- PlotArea.PenHighlightColor
- PlotArea.PenHighlightWidth
- PlotArea.SingleTagMode
- PlotImage
- ShowContextMenu
- SuppressErrors
- TimeAxis.Cursor1.Color
- TimeAxis.Cursor1.Pos
- TimeAxis.Cursor1.Style
- TimeAxis.Cursor1.Width
- TimeAxis.Cursor2.Color
- TimeAxis.Cursor2.Pos
- TimeAxis.Cursor2.Style
- TimeAxis.Cursor2.Width
- TimeAxis.LabelColor
- TimeAxis.NumGridPerValue
- TimeAxis.NumValues
- TimeAxis.ShowCursors

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- TimeSelector
- TimeSelector.DurationMS
- TimeSelector.EndDate
- TimeSelector.StartDate
- TimeSelector.TimeDuration
- ToolTipText
- TrendVersion
- ValueAxis.Label
- ValueAxis.NumGridPerValue
- ValueAxis.NumValues
- Visible

This section describes all the scriptable properties available in the Trend Client.

You can access the properties of an individual pen by setting it as the current pen and then applying the pen properties.

### Chart.AddMultiplePens

The Chart.AddMultiplePens is a read-write Boolean property that suspends or enables a chart refresh while multiple pens are added to the chart.

#### Syntax

```
Chart.AddMultiplePens = bool;
Result = Chart.AddMultiplePens;
```

#### Remarks

The default is FALSE (allows the chart refresh while multiple pens are added to the chart).

You can set this property to TRUE, then add multiple properties using a script without refreshing the graph. After adding the final property value, the script returns this property to FALSE. The graph is automatically refreshed and shows all pens that have been added.

### Chart.BackgroundColor

The Chart.BackgroundColor property is a read-write property that gets or sets the background color of the chart.

#### Syntax

```
Chart.BackgroundColor = color;
Result = Chart.BackgroundColor;
```

#### Remarks

The default is white.

Color is a .NET Framework data type. You can use various color methods to set the color, such as a predefined color name, FromARGB(), FromKnownColor(), and FromName(). For a list of the .NET color names and the corresponding hexadecimal codes, see .NET Colors. For more information on the color methods, see the Microsoft documentation for .NET Framework development.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Chart.Freeze

The Chart.Freeze property is a read-write Boolean property that stops (TRUE) or starts (FALSE) the trend display from updating.

**Syntax**

```
Chart.Freeze = bool;
Result = Chart.Freeze;
```

**Remarks**

The default is FALSE, which continues (or resumes) the trend display updates. Setting the property to TRUE stops the trend display updates.

### Chart.FreezeDurationMS

The Chart.FreezeDurationMS property is a read-write integer property that freezes the chart from live updates for the specified duration in milliseconds.

**Syntax**

```
Chart.FreezeDurationMS = int;
Result = Chart.FreezeDurationMS;
```

**Remarks**

The default is 600000 (10 minutes).

---

**Note:** When freeze duration is set to a value other than 0, in run time after a freeze has been initiated, live updates appear on the Trend Client automatically after the configured time has elapsed. If Freeze Duration for chart is set to 0, the auto resume feature is disabled.

---

### Chart.HidePenList

The Chart.HidePenList property is a read-write Boolean property that shows or hides the pen list in the chart.

**Syntax**

```
Chart.HidePenList = bool;
Result = Chart.HidePenList;
```

**Remarks**

The default is TRUE, which implies that the chart is hidden.

### Chart.Labels

The Chart.Labels property is a read-write integer property that sets the visibility of labels (chart label, X and Y axes scales, and cursor information) in the chart. Supported options are All and None (where 0 = All and 1 = None).

**Syntax**

```
Chart.Labels = int;
Result = Chart.Labels;
```

**Remarks**

The default is 0 (All).

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Chart.PenPrecision

The Chart.PenPrecision property is a read-write integer property that gets or sets the number of decimal places to show by default for the data value.

**Syntax**

```
Chart.PenPrecision = int;
Result = Chart.PenPrecision;
```

**Remarks**

The default is 0.

### Chart.RefreshEntireChartIntervals

The Chart.RefreshEntireChartIntervals property is a read-write integer property that refreshes the entire chart at every specified number of intervals. (The interval is specified with the Chart.UpdateRateMS property.) If the value is '0' the chart only adds new data to the chart; however, it does not refresh the data already present on the chart.

**Syntax**

```
Chart.RefreshEntireChartInterval = int;
Result = Chart.RefreshEntireChartIntervals;
```

**Remarks**

The default is 100 intervals.

### Chart.RetrievalMode

The Chart.RetrievalMode property is a read-write integer property that gets or sets the data retrieval mode for retrieving the data from IndustrialSQL Server at the chart level. Supported options are cyclic and full (where 0 = cyclic and 2 = full).

**Syntax**

```
Chart.RetrievalMode = int;
Result = Chart.RetrievalMode;
```

**Remarks**

The default is 0 (cyclic).

### Chart.UpdateRateMS

The Chart.UpdateRateMS property is a read-write integer property that gets or sets the chart refresh interval in milliseconds.

**Syntax**

```
Chart.UpdateRateMS = int;
Result = Chart.UpdateRateMS;
```

**Remarks**

The default is 1000.

### HistorySources

The HistorySources property is a read-only object property that gets a list of history sources. For more information about the HistorySources properties, see "Trend Client History Sources".

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

**Syntax**

```
Result = HistorySources;
```

**Example**

```
Dim histSources = TrendClient1.HistorySources;
Dim histSource = histSources.GetSource("<history source name>");
```

**Remarks**

No default.

### Pen.Color

The Pen.Color property is a read-write property that gets or sets the color of the currently selected pen.

**Syntax**

```
Pen.Color = color;
Result = Pen.Color;
```

**Remarks**

The default is color.

Color is a .NET Framework data type. You can use various color methods to set the color, such as a predefined color name, FromARGB(), FromKnownColor(), and FromName(). For a list of the .NET color names and the corresponding hexadecimal codes, see .NET Colors. For more information on the color methods, see the Microsoft documentation for .NET Framework development.

### Pen.Count

The Pen.Count property is a read-only integer property that gets the number of the pens in the pen list.

**Syntax**

```
Result = Pen.Count;
```

**Remarks**

The default is 0.

### Pen.Description

The Pen.Description property is a read-write string property that gets or sets the description of the currently selected pen.

**Syntax**

```
Pen.Description = string;
Result = Pen.Description;
```

**Remarks**

If the pen expression was configured by browsing to the attribute in the Attribute Browser, the default value is obtained from the corresponding description property of the associated application server attribute. Otherwise, the default value is blank if the pen expression is manually configured.

### Pen.Expression

The Pen.Expression property is a read-write string property that gets or sets the expression of the currently selected pen. The expression can be a Galaxy attribute, InTouch tag reference, or an expression.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

**Syntax**

```
Pen.Expression = string;
Result = Pen.Expression;
```

**Remarks**

The default is blank.

### Pen.Format

The Pen.Format property is a read-write integer property that gets or sets the format of the current pen (where 0 is decimal and 1 is scientific).

**Syntax**

```
Pen.Format = int;
Result = Pen.Format;
```

**Remarks**

The default is 0 (decimal).

### Pen.HistorySource

The Pen.HistorySource property is a read-only string property that gets the history source of the currently selected pen. For more information about the HistorySources properties, see "Trend Client History Sources".

**Note:** This value is empty when no historical source is configured, if an expression is configured, or if no historical tag is configured.

**Syntax**

```
Result = Pen.HistorySource;
```

**Remarks**

The default is blank.

### Pen.HistoryTagName

The Pen.HistoryTagName property is a read-write string property that gets or sets the historical tag name for the currently selected pen.

**Syntax**

```
Pen.HistoryTagName = string;
Result = Pen.HistoryTagName;
```

**Remarks**

The default is blank.

### Pen.Index

The Pen.Index property is a read-only integer property that gets the index of the currently selected pen, or -1 if no pen is selected. The array is zero-based.

**Syntax**

```
Result = Pen.Index;
```

**Remarks**

The default is -1.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Pen.Name

The Pen.Name property is a read-write string property that gets or sets the name of the currently selected pen.

**Syntax**

```
Pen.Name = string;
Result = Pen.Name;
```

**Remarks**

The default is blank.

### Pen.Precision

The Pen.Precision property is a read-write integer property that gets or sets the decimal precision of the currently selected pen.

**Syntax**

```
Pen.Precision = int;
Result = Pen.Precision;
```

**Remarks**

The default is the trend chart's pen precision property.

### Pen.RetrievalMode

The Pen.RetrievalMode property is a read-write enumerated property that gets or sets the mode for retrieving the data from IndustrialSQL Server of the currently selected pen. Supported options are:

0 = Cyclic

2 = Full

12 = ApplicationSetting

**Syntax**

```
Pen.RetrievalMode = enum;
Result = Pen.RetrievalMode;
```

**Remarks**

The default is the trend chart's retrieval mode property (12).

### Pen.Style

The Pen.Style property is a read-write integer property that gets or sets the line style of the currently selected pen.

Valid values are:

0 = Solid

1 = Dash

2 = DashDot

3 = DashDotDot

4 = Dot

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

**Syntax**

```
Pen.Style = int;
Result = Pen.Style;
```

**Remarks**

The default is 0.

### Pen.TrendHi

The Pen.TrendHi property is a read-write double property that gets or sets the high value of the value range to be used for the currently selected pen.

**Syntax**

```
Pen.TrendHi = double;
Result = Pen.TrendHi;
```

**Remarks**

If the pen expression was configured by browsing to the attribute in the Attribute Browser, the default value is set to the corresponding TrendHi property of the associated application server attribute. Otherwise, the default value is 100 if the pen expression is manually configured.

### Pen.TrendLo

The Pen.TrendLo property is a read-write double property that gets or sets the low value of the value range to be used for the currently selected pen.

**Syntax**

```
Pen.TrendLo = double;
Result = Pen.TrendLo;
```

**Remarks**

If the pen expression was configured by browsing to the attribute in the Attribute Browser, the default value is set to the corresponding TrendLo property of the associated application server attribute. Otherwise, the default value is 0 if the pen expression is manually configured.

### Pen.TrendType

The Pen.TrendType property is a read-write integer property that gets or sets the plot type of the currently selected pen.

0 = Point

1 = Line

2 = StepLine

3 = Auto

When Pen.TrendType is set to Auto and there is no Historian default available, the Trend Client uses a plot type of **Line** for real tags and **StepLine** for integer tags.

**Syntax**

```
Pen.TrendType = int;
Result = Pen.TrendType;
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Remarks

The default is 3.

## Pen.Units

The Pen.Units property is a read-write string property that gets or sets the units of the currently selected pen.

### Syntax

```
Pen.Units = string;
Result = Pen.Units;
```

### Remarks

If the pen expression was configured by browsing to the attribute in the Attribute Browser, the default value is set to the corresponding EngUnits property of the associated application server attribute. Otherwise, the default value is blank if the pen expression is manually configured.

## Pen.Visible

The Pen.Visible property is a read-write Boolean property that gets or sets the visible property for the currently selected pen.

### Syntax

```
Pen.Visible = bool;
Result = Pen.Visible;
```

### Remarks

The default is TRUE (the pen is visible on the chart). When this property is set to FALSE, the pen is hidden from the chart display.

## Pen.Width

The Pen.Width property is a read-write integer property that gets or sets the line width (from 1 to 10) of the currently selected pen.

### Syntax

```
Pen.Width = int;
Result = Pen.Width;
```

### Remarks

The default is 1, when a pen is added to the pen list. If there is no pen in the pen list, the default is 0.

## PenSelectorHeight

The PenSelectorHeight property is a read-write integer property that gets or sets the height of the pen selector in pixels.

### Syntax

```
PenSelectorHeight = int;
Result = PenSelectorHeight;
```

### Remarks

The default is 97.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### PenUQRelativeOpacity

The PenUQRelativeOpacity property is a read-write integer property that gets or sets the line's relative opacity when the data quality is uncertain.

The two properties, relative opacity and relative thickness, create a visual distinction for values with uncertain quality. When the pen type is point, no visual change is shown on the trend.

**Syntax**

```
PenUQRelativeOpacity = int;
Result = PenUQRelativeOpacity;
```

**Remarks**

The default is 25%.

For example, if the pen has an opacity of 80% and the data quality is "uncertain," then the Trend Client calculates the opacity of the pen as 80% x 25% = 20% opaque.

### PenUQRelativeThickness

The PenUQRelativeThickness property is a read-write integer property that gets or sets the line's relative thickness when data quality is uncertain.

The two properties, relative opacity, and relative thickness, create a visual distinction for values with uncertain quality. When the pen type is point, no visual change is shown on the trend.

**Syntax**

```
PenUQRelativeThickness = int;
Result = PenUQRelativeThickness;
```

**Remarks**

The default is 200%.

For example, if a line is 1 pixel wide and 200% thick, then the Trend Client calculates the thickness of the line with a data quality of "uncertain" as 1 pixel x 200% = 2 pixels wide.

### PlotArea.BackgroundColor

The PlotArea.BackgroundColor property is a read-write property that gets or sets the color of the plot area of the graph.

**Syntax**

```
PlotArea.BackgroundColor = color;
Result = PlotArea.BackgroundColor;
```

**Remarks**

The default is white.

Color is a .NET Framework data type. You can use various color methods to set the color, such as a predefined color name, FromARGB(), FromKnownColor(), and FromName(). For a list of the .NET color names and the corresponding hexadecimal codes, see .NET Colors. For more information on the color methods, see the Microsoft documentation for .NET Framework development.

### PlotArea.BorderColor

The PlotArea.BorderColor property is a read-write property that gets or sets the color of the plot area's border.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

**Syntax**

```
PlotArea.BorderColor = color;
Result = PlotArea.BorderColor;
```

**Remarks**

The default is black.

Color is a .NET Framework data type. You can use various color methods to set the color, such as a predefined color name, FromARGB(), FromKnownColor(), and FromName(). For a list of the .NET color names and the corresponding hexadecimal codes, see .NET Colors. For more information on the color methods, see the Microsoft documentation for .NET Framework development.

### PlotArea.GradientEndColor

The PlotArea.GradientEndColor property is a read-write property that gets or sets the gradient end color of the plot area of the graph.

**Syntax**

```
PlotArea.GradientEndColor = color;
Result = PlotArea.GradientEndColor;
```

**Remarks**

The default is white.

Color is a .NET Framework data type. You can use various color methods to set the color, such as a predefined color name, FromARGB(), FromKnownColor(), and FromName(). For a list of the .NET color names and the corresponding hexadecimal codes, see .NET Colors. For more information on the color methods, see the Microsoft documentation for .NET Framework development.

### PlotArea.GradientType

The PlotArea.GradientType property is a read-write integer property that gets or sets the gradient type of the plot area of the graph.

0 = None (no gradient)

1 = LeftRight

2 = TopBottom

3 = Center

4 = DiagonalLeft

5 = DiagonalRight

6 = HorizontalCenter

7 = VerticalCenter

**Syntax**

```
PlotArea.GradientEndType = int;
Result = PlotArea.GradientEndType;
```

**Remarks**

The default is 0.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### PlotArea.GridColor

The PlotArea.GridColor property is a read-write property that gets or sets the color of grid.

**Syntax**

```
PlotArea.GridColor = color;
Result = PlotArea.GridColor;
```

**Remarks**

The default is grey.

Color is a .NET Framework data type. You can use various color methods to set the color, such as a predefined color name, FromARGB(), FromKnownColor(), and FromName(). For a list of the .NET color names and the corresponding hexadecimal codes, see .NET Colors. For more information on the color methods, see the Microsoft documentation for .NET Framework development.

### PlotArea.GridHorizontal

The PlotArea.GridHorizontal property is a read-write Boolean property that shows or hides the horizontal grid.

**Syntax**

```
PlotArea.GridHorizontal = bool;
Result = PlotArea.GridHorizontal;
```

**Remarks**

The default is TRUE, which implies that the horizontal grid is shown.

### PlotArea.GridStyle

The PlotArea.GridStyle property is a read-write integer property that gets or sets the grid line style.

0 = Solid

1 = Dash

2 = DashDot

3 = DashDotDot

4 = Dot

**Syntax**

```
PlotArea.GridStyle = int;
Result = PlotArea.GridStyle;
```

**Remarks**

The default is 0.

### PlotArea.GridVertical

The PlotArea.GridVertical property is a read-write Boolean property that shows or hides the vertical grid.

**Syntax**

```
PlotArea.GridVertical = bool;
Result = PlotArea.GridVertical;
```

**Remarks**

The default is TRUE, which implies that the vertical grid is shown.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### PlotArea.GridWidth

The PlotArea.GridWidth property is a read-write integer property that gets or sets the width of the grid. Allowed values are 1 to 10.

**Syntax**

```
PlotArea.GridWidth = int;
Result = PlotArea.GridWidth;
```

**Remarks**

The default is 1.

### PlotArea.HighlightCurrentPen

The PlotArea.HighlightCurrentPen property is a read-write Boolean property that highlights the currently selected pen.

**Syntax**

```
PlotArea.HighlightCurrentPen = bool;
Result = PlotArea.HighlightCurrentPen;
```

**Remarks**

The default is TRUE , which implies that the currently selected pen is highlighted.

### PlotArea.PenHighlightColor

The PlotArea.PenHighlightColor property is a read-write property that gets or sets the pen's highlight color.

**Syntax**

```
PlotArea.PenHighlightColor = color;
Result = PlotArea.PenHighlightColor;
```

**Remarks**

The default is yellow.

Color is a .NET Framework data type. You can use various color methods to set the color, such as a predefined color name, FromARGB(), FromKnownColor(), and FromName(). For a list of the .NET color names and the corresponding hexadecimal codes, see .NET Colors. For more information on the color methods, see the Microsoft documentation for .NET Framework development.

### PlotArea.PenHighlightWidth

The PlotArea.PenHighlightWidth property is a read-write integer property that gets or sets the width of the pen's highlight color. Allowed values are 1 to 5.

**Syntax**

```
PlotArea.PenHighlightWidth = int;
Result = PlotArea.PenHighlightWidth;
```

**Remarks**

The default is 2.

### PlotArea.SingleTagMode

The PlotArea.SingleTagMode property is a read-write Boolean property that sets whether to show only the currently selected pen or all pens.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

**Syntax**

```
PlotArea.SingleTagMode = bool;
Result = PlotArea.SingleTagMode;
```

**Remarks**

The default is FALSE.

### PlotImage

The PlotImage property is a read-write string property that gets or sets the plot background image for the chart.

**Syntax**

```
PlotImage = string;
Result = PlotImage;
```

**Remarks**

The value of this property is the folder path and filename for the image. Supported image types are .jpeg, .gif, .bmp, and .png.

The default is blank.

### ShowContextMenu

The ShowContextMenu property is a Boolean property that shows the context menu in run time.

**Syntax**

```
ShowContextMenu = bool;
Result = ShowContextMenu;
```

**Remarks**

The default is TRUE, which implies that the context menu is shown in run time.

### SuppressErrors

The SuppressErrors property is a read-write Boolean property that suppresses or allows error messages.

**Syntax**

```
SuppressErrors = bool;
Result = SuppressErrors;
```

**Remarks**

The default is TRUE which implies that the errors are suppressed.

**Note:** All errors are logged to Logger regardless of this setting.

### TimeAxis.Cursor1.Color

The TimeAxis.Cursor1.Color property is a read-write property that gets or sets the color of the left time axis cursor.

**Syntax**

```
TimeAxis.Cursor1.Color = color;
Result = TimeAxis.Cursor1.Color;
```

**Remarks**

The default is red.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

Color is a .NET Framework data type. You can use various color methods to set the color, such as a predefined color name, FromARGB(), FromKnownColor(), and FromName(). For a list of the .NET color names and the corresponding hexadecimal codes, see .NET Colors. For more information on the color methods, see the Microsoft documentation for .NET Framework development.

### TimeAxis.Cursor1.Pos

The TimeAxis.Cursor1.Pos property is a read-write property that gets or sets the time position of the left time axis cursor.

**Syntax**

```
TimeAxis.Cursor1.Pos = datetime;
Result = TimeAxis.Cursor1.Pos;
```

**Remarks**

No default.

### TimeAxis.Cursor1.Style

The TimeAxis.Cursor1.Style property is a read-write integer property that gets or sets the style of the left time axis cursor. Valid values are:

0 = Solid

1 = Dash

2 = DashDot

3 = DashDotDot

4 = Dot

**Syntax**

```
TimeAxis.Cursor1.Style = int;
Result = TimeAxis.Cursor1.Style;
```

**Remarks**

The default is 0.

### TimeAxis.Cursor1.Width

The TimeAxis.Cursor1.Width property is a read-write integer property that gets or sets the width of the left time axis cursor. Allowed values are 1 to 10.

**Syntax**

```
TimeAxis.Cursor1.Width = int;
Result = TimeAxis.Cursor1.Width;
```

**Remarks**

The default is 1.

### TimeAxis.Cursor2.Color

The TimeAxis.Cursor2.Color property is a read-write property that gets or sets the color of the right time axis cursor.

**Syntax**

```
TimeAxis.Cursor2.Color = color;
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

```
Result = TimeAxis.Cursor2.Color;
```

**Remarks**

The default is blue.

Color is a .NET Framework data type. You can use various color methods to set the color, such as a predefined color name, FromARGB(), FromKnownColor(), and FromName(). For a list of the .NET color names and the corresponding hexadecimal codes, see .NET Colors. For more information on the color methods, see the Microsoft documentation for .NET Framework development.

### TimeAxis.Cursor2.Pos

The TimeAxis.Cursor2.Pos property is a read-write property that gets or sets the time position of the right time axis cursor.

**Syntax**

```
TimeAxis.Cursor2.Pos = datetime;
Result = TimeAxis.Cursor2.Pos;
```

**Remarks**

No default.

### TimeAxis.Cursor2.Style

The TimeAxis.Cursor2.Style property is a read-write integer property that gets or sets the style of the right time axis cursor. Valid values are:

0 = Solid

1 = Dash

2 = DashDot

3 = DashDotDot

4 = Dot

**Syntax**

```
TimeAxis.Cursor2.Style = int;
Result = TimeAxis.Cursor2.Style;
```

**Remarks**

The default is 0.

### TimeAxis.Cursor2.Width

The TimeAxis.Cursor2.Width property is a read-write integer property that gets or sets the width of the right time axis cursor. Allowed values are 1 to 10.

**Syntax**

```
TimeAxis.Cursor2.Width = int;
Result = TimeAxis.Cursor2.Width;
```

**Remarks**

The default is 1.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### TimeAxis.LabelColor

The TimeAxis.LabelColor property is a read-write property that gets or sets the color of the time axis labels.

**Syntax**

```
TimeAxis.LabelColor = color;
Result = TimeAxis.LabelColor;
```

**Remarks**

The default is black.

Color is a .NET Framework data type. You can use various color methods to set the color, such as a predefined color name, FromARGB(), FromKnownColor(), and FromName(). For a list of the .NET color names and the corresponding hexadecimal codes, see .NET Colors. For more information on the color methods, see the Microsoft documentation for .NET Framework development.

### TimeAxis.NumGridPerValue

The TimeAxis.NumGridPerValue property is a read-write integer property that gets or sets the number of grid lines that appear between each value shown on time axis. The valid range is 1 to 20.

**Syntax**

```
TimeAxis.NumGridPerValue = int;
Result = TimeAxis.NumGridPerValue;
```

**Remarks**

The default is 3.

### TimeAxis.NumValues

The TimeAxis.NumValues property is a read-write integer property that gets or sets the number of time labels that are shown along the time axis. The valid range is 2 to 15.

**Syntax**

```
TimeAxis.NumValues = int;
Result = TimeAxis.NumValues;
```

**Remarks**

The default is 6.

### TimeAxis.ShowCursors

The TimeAxis.ShowCursors property is a read-write Boolean property that shows or hides the time axis cursors.

**Syntax**

```
TimeAxis.ShowCursors = bool;
Result = TimeAxis.ShowCursors;
```

**Remarks**

The default is FALSE.

### TimeSelector

The TimeSelector property is a read-only property that gets the Time Range Picker object used in the Trend Client. You can use it in scripting to shorten the code using its properties and methods.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

For the individual properties and methods, see the following properties, or the methods starting at "TimeSelector.GetStartAndEndTimes".

**Example 1**

```
dim TRP as object;
TRP = TrendClient1.TimeSelector;
StartDate = TRP.StartDate;
EndDate = TRP.EndDate;
duration = TRP.TimeDuration;
```

**Example 2**

```
dim TRP as object;
TRP = TrendClient1.TimeSelector;
TRP.SetStartAndEndTimes(StartDate, EndDate, Duration);
```

**Remarks**

The return value is a TimeRangePicker.

### TimeSelector.DurationMS

The TimeSelector.DurationMS property is a read-write integer property that gets the time duration measured in milliseconds.

The start time of the Trend Client (TimeSelector.StartDate) is calculated as the end time (TimeSelector.EndDate) minus the new time duration (TimeSelector.DurationMS).

When you set the value of the TimeSelector.DurationMS property, the TimeSelector.TimeDuration property is set to 0.

**Syntax**

```
result = TimeSelector.DurationMS;
TimeSelector.DurationMS = Value;
```

**Remarks**

The default value is 300000.

### TimeSelector.EndDate

The TimeSelector.EndDate property is a read-only string property that gets the end date and time of the Trend Client.

The default value is the time the Trend Client is placed on the canvas. If the **Update to Current Time** option is enabled, the TimeSelector.EndDate property is updated with the current time.

**Note:** To set the end date and time of the Trend Client, use the TimeSelector.SetStartAndEndTimes method.

**Syntax**

```
result = Trend01.TimeSelector.EndDate;
```

### TimeSelector.StartDate

The TimeSelector.StartDate property is a read-only string property that gets the start date and time of the Trend Client.

**Syntax**

```
result = TimeSelector.StartDate;
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Remarks

The default value is the time the Trend Client is placed on the canvas minus the duration.

**Note:** To set the start date and time of the Trend Client, use the TimeSelector.SetStartAndEndTimes method.

## TimeSelector.TimeDuration

The TimeSelector.TimeDuration property is a read-write enumerated property that gets or sets the enumerated duration of the time axis of the chart.

### Syntax

```
TimeSelector.TimeDuration = enum;
Result = TimeSelector.TimeDuration;
```

The TimeSelector.TimeDuration property is a read-write integer property that gets or sets the time duration. The start time of the Trend Client (TimeSelector.StartDate) is calculated as the end time (TimeSelector.EndDate) minus the new time duration.

The TimeSelector.TimeDuration can have one of the following values:

| Value | Description |
|---|---|
| 0 | Custom |
| 1 | The last minute. |
| 2 | The last five minutes. |
| 3 | The last ten minutes. |
| 4 | The last 15 minutes. |
| 5 | The last 30 minutes. |
| 6 | The last hour. |
| 7 | The last two hours. |
| 8 | The last four hours. |
| 9 | The last eight hours. |
| 10 | The last 12 hours. |
| 11 | The last 24 hours. |
| 12 | The last two days. |
| 13 | The last week. |
| 14 | The last two weeks. |
| 15 | The last month. |
| 16 | The last three months. |
| 17 | One minute. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Value | Description |
|---|---|
| 18 | Five minutes. |
| 19 | Ten minutes. |
| 20 | 15 minutes. |
| 21 | 30 minutes. |
| 22 | One hour. |
| 23 | Two hours. |
| 24 | Four hours. |
| 25 | Eight hours. |
| 26 | 12 hours. |
| 27 | 24 hours. |
| 28 | Two days. |
| 29 | One week. |
| 30 | Two weeks. |
| 31 | One month. |
| 32 | Three months. |
| 33 | Yesterday: 0:00:00 of the previous day to 0:00:00 of the current day. |
| 34 | Current day: 0:00:00 of the current day to the current time. |
| 35 | Previous hour: The start of the previous hour to the start of the current hour. |
| 36 | Current hour: The start of the current hour to the current time. |

### Syntax

```
result = TimeSelector.TimeDuration;
TimeSelector.TimeDuration = Value;
```

### Example

```
Trend01.TimeSelector.TimeDuration = 5;
// The trend is now set to show the last 30 minutes.
```

### Remarks

The default is 18 (5 minutes).

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### ToolTipText

The ToolTipText property is a read-write string property that gets or sets the pop-up text that appears when the mouse is hovered over the chart at run time.

**Syntax**

```
ToolTipText = string;
Result = ToolTipText;
```

**Remarks**

The default is blank.

### TrendVersion

The TrendVersion property is a read-only string property that gets the version of the trend.

**Syntax**

```
Result = TrendVersion;
```

**Remarks**

The return value is 1.0.0 for the first release.

### ValueAxis.Label

The ValueAxis.Label property is a read-write integer property that gets or sets which labels are shown on the value axis.

0 = MultipleScales

1 = SingleScale

2 = ValuesAtCursor

**Syntax**

```
ValueAxis.Label = int;
Result = ValueAxis.Label;
```

**Remarks**

The default is 0.

### ValueAxis.NumGridPerValue

The ValueAxis.NumGridPerValue property is a read-write integer property that gets or sets the number of grid lines that appear between each value shown along the Y-axis. The valid range is 1 to 20.

**Syntax**

```
ValueAxis.NumGridPerValue = int;
Result = ValueAxis.NumGridPerValue;
```

**Remarks**

The default is 2.

### ValueAxis.NumValues

The ValueAxis.NumValues property is a read-write integer property that gets or sets the number of value labels that are shown along the Y-axis. The valid range is 2 to 15.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

**Syntax**

```
ValueAxis.NumValues = int;
Result = ValueAxis.NumValues;
```

**Remarks**

The default is 6.

### Visible

The Visible property is a read-write Boolean property that shows or hides the Trend Client at run time.

**Syntax**

```
Visible = bool;
Result = Visible;
```

**Remarks**

The default is TRUE.

## Trend Client History Sources

The Trend Client has the following scriptable methods for the history sources:

- HistorySources.Add
- HistorySource.Authentication
- HistorySource.Connect
- HistorySources.Count
- HistorySource.Disconnect
- HistorySource.Domain
- HistorySources.GetSource
- HistorySources.Items
- HistorySource.Password
- HistorySources.Remove
- HistorySource.RetainPassword
- HistorySource.ServerName
- HistorySource.Type
- HistorySource.UNCPath
- HistorySources.Update
- HistorySource.UserID

### HistorySources.Add

HistorySources.Add method adds a new history source.

**Example**

```
Dim histSources = Trend1.HistorySources;
Dim ret =  histSources.Add("idc_insql12", "InSQL");
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Syntax

```
[Result =] HistorySources.Add(string HistorySourceName, string Type);
```

### Parameters

*HistorySourceName*
The name of the history source.

*Type*
The type of history source "InSQL" or "InTouch".

### Return Value

If there is already a server with the given name in the list, the object for that server is returned. Otherwise, a new server with the given name is added to the list and the object for the new server is returned.

## HistorySource.Authentication

The HistorySource.Authentication property is a read-write string property that gets or sets the authentication mode for the connection to the server. Available options are SQL Server, Windows Account, and Windows Integrated.

### Syntax

```
HistorySource.Authentication = string;
Result = HistorySource.Authentication;
```

### Remarks

The default is Windows Integrated.

## HistorySource.Connect

HistorySource.Connect method logs on to the current history source.

### Example

```
Dim histSources = Trend1.HistorySources;
Dim histSource =  histSources.GetSource("idc_insql12");
Dim statusMsg as string;
Dim ret = histSource.Connect(statusMsg);
```

### Syntax

```
[Result =] HistorySource.Connect(string statusMessage);
```

### Parameters

*statusMessage*

Information of the result of the log on attempt.

### Return Value

Returns TRUE if the log on was successful; otherwise, returns FALSE. The server must be configured before calling the Connect method. Changes made to the server configuration after a connect do not take effect until after a disconnect and subsequent connect.

## HistorySources.Count

The HistorySources.Count property is a read-only integer property that shows the number of history sources configured.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Syntax

```
Result = HistorySources.Count;
```

### Remarks

The default is 0.

## HistorySource.Disconnect

HistorySource.Disconnect method logs off the connection to the current history source.

### Example

```
Dim histSources = Trend1.HistorySources;
Dim histSource =  histSources.GetSource("idc_insql12");
histSource.Disconnect();
```

### Syntax

```
[Result =] HistorySource.Disconnect();
```

### Parameters

None.

### Return Value

None.

### Remarks

Repeated calls to this method are harmless and do not result in further state change events.

## HistorySource.Domain

The HistorySource.Domain property is a read-write string property that gets or sets the domain name for the connection to the Historian.

### Syntax

```
HistorySource.Domain = string;
Result = HistorySource.Domain;
```

### Remarks

The default is an empty message value ( "" ).

This property is not applicable if you are using an InTouch LGH file as the data source.

## HistorySources.GetSource

HistorySources.GetSource method gets the named history source object for a server from the server list.

### Example

```
Dim histSources = Trend1.HistorySources;
Dim histSource =  histSources.GetSource("IDC_INSQL15");
```

### Syntax

```
[Result =] HistorySources.GetSource(string HistorySourceName);
```

### Parameters

*HistorySourceName*
The name of the history source.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Return Value

If the server exists, the object is returned; otherwise, a NULL is returned.

## HistorySources.Items

The HistorySources.Items property is a read-only array property that shows the array of history source names.

### Syntax

```
Result = HistorySources.Items;
```

### Remarks

No default.

### Example

```
Populate a string array uda of a userdefined instance with the server names configured in
the Trend Control, and then add them to a list box control on the canvas)
dim i as integer;
dim b as object;
ListBox1.Clear();
for i = 1 to TrendClient1.HistorySources.Count;
b = TrendClient1.HistorySources.Items[i];
UserDefined_001.items[i] = b.ServerName;
ListBox1.AddItem(UserDefined_001.Items[i]);
next;
```

## HistorySource.Password

The HistorySource.Password property is a read-write string property that gets and sets the password for the connection to the server.

### Syntax

```
HistorySource.Password = string;
Result = HistorySource.Password;
```

### Remarks

The default is wwUser.

## HistorySources.Remove

HistorySources.Remove method removes the specified history source from the list.

### Example

```
Dim histSources = Trend1.HistorySources;
Dim ret = histSources.Remove("IDC_INSQL15");
```

### Syntax

```
[Result =] HistorySources.Remove(string HistorySourceName);
```

### Parameters

*HistorySourceName*
The name of the history source.

### Return Value

This method returns TRUE if the instance was removed from the list. This method returns FALSE if the exact instance is not in the list, and the list remains unchanged.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### HistorySource.RetainPassword

The HistorySource.RetainPassword property is a read-write Boolean property that indicates whether the password is stored in persistent storage.

**Syntax**

```
HistorySource.RetainPassword = bool;
Result = HistorySource.RetainPassword;
```

**Remarks**

The default is TRUE (the password is stored in persistent storage).

This property is not applicable if you are using an InTouch LGH file as the data source.

### HistorySource.ServerName

The HistorySource.ServerName property is a read-write string property that gets or sets the name of the history source.

**Syntax**

```
HistorySource.ServerName = string;
Result = HistorySource.ServerName;
```

**Remarks**

The default is an empty message value ( "" ).

### HistorySource.Type

The HistorySource.Type property is a read-write string property that gets or sets the type of the history source. Possible values are "InSQL" (Historian Server) and InTouch (InTouch History Files).

**Syntax**

```
HistorySource.Type = string;
Result = HistorySource.Type;
```

**Remarks**

The default is "InSQL."

### HistorySource.UNCPath

The HistorySource.UNCPath property is a read-write string property that gets or sets the UNC path of the InTouch Log History/LGH file.

**Syntax**

```
HistorySource.UNCPath = string;
Result = HistorySource.UNCPath;
```

**Remarks**

The default is an empty message value ( "" ).

### HistorySources.Update

HistorySources.Update method updates the specified history source in the list.

**Example**

```
Dim histSources = Trend1.HistorySources;
Dim ret = histSources.Update("IDC_INSQL15");
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Syntax

```
[Result =] HistorySources.Update(string HistorySourceName);
```

### Parameters

*HistorySourceName*
The name of the history source.

### Return Value

Returns TRUE if the given instance is currently in the server list; otherwise, it returns FALSE.

## HistorySource.UserID

The HistorySource.UserID property is a read-write string property that gets and sets the user ID for the Historian.

### Syntax

```
HistorySource.UserID = string;
Result = HistorySource.UserID;
```

### Remarks

The default is wwUser.

This property is not applicable if you are using an InTouch LGH file as the data source.

# Trend Client Methods

The following are the methods used by the Trend Client:

- AddHistorianSource
- AddPen
- ClearPens
- DeleteCurrentPen
- GetHistorianSource
- GetPenValAtX1
- GetStartAndEndTimes
- MoveNextPen
- MovePrevPen
- RefreshData
- RefreshTimes
- RemoveHistorianSource
- RemovePen
- ScaleAllPens
- ScaleAutoAllPens
- ScaleAutoPen
- ScaleDownAllPens

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- ScaleDownPen
- ScaleMoveAllPensDown
- ScaleMoveAllPensUp
- ScaleMovePenDown
- ScaleMovePenUp
- ScalePen
- ScaleUpAllPens
- ScaleUpPen
- SetCurrentPen
- SetDuration
- SetStartAndEndTimes
- TimeSelector.GetStartAndEndTimes
- TimeSelector.RefreshTimes
- TimeSelector.SetStartAndEndTimes
- UpdateHistorianSource

The following section describes the scriptable methods available in the Trend Client.

### AddHistorianSource

AddHistorianSource method adds a new history source.

#### Example

```
Dim b as object;
b = Trend1.AddHistorianSource("idc_insql12", "InSQL");
```

#### Syntax

```
[Result =] Trend1.AddHistorianSource(string HistorySourceName, string Type);
```

#### Parameters

*HistorySourceName*
The name of the history source.

*Type*
The type of history source "InSQL" or "InTouch".

#### Return Value

If there is already a server with the given name in the list, the object for that server is returned. Otherwise, a new server with the given name is added to the list and the object for the new server is returned.

#### Recommended Usage

Whenever the AddHistorianSource method is used in a script, such as the Predefined Script OnShow on a symbol, we strongly recommend that you add a corresponding call to RemoveHistorianSource. This can be added in a Predefined Script OnHide on a symbol. AddHistorianSource creates resources inside the InTouch view application that are not cleaned up when a window is closed during a view.exe session. To clean up these

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

resources, you must use a call from a script to RemoveHistorianSource, or close the view.exe session and end the runtime application.

### AddPen

The AddPen method adds a named pen to the trend.

#### Examples

```
dim b as boolean;
b = Trend1.AddPen("MyPen01","UserDefined_001.Value", "InSQL01","UserDefined_001.Value", 1);
b = Trend1.AddPen("MyPen02","InTouch:$Second", "InSQL01","$Second", 1);
b = Trend1.AddPen("MyPen03", "MyContainer.InletPump1+MyContainer.InletPump2","","",1);
```

#### Syntax

```
[Result=] AddPen(string PenName, string TagName, string HistorySource, string
HistoryTagName, int HistoryTagType);
```

#### Parameters

*PenName*
The name of the pen to add.

*TagName*
The name of the tag associated with the pen being added.

*HistorySource*
The history source for the pen being added.

*HistoryTagName*
The name of the history tag for the pen being added.

*HistoryTagType*
The type of history tag for the pen being added: 1 for Historian or 3 for LGH.

#### Return Value

Returns TRUE if the pen was successfully added; otherwise, returns FALSE.

#### Recommended Usage

Whenever the AddPen method is used in a script, such as the Predefined Script OnShow on a symbol, we strongly recommend that you add a corresponding call to ClearPens. This can be added in a Predefined Script OnHide on a symbol. AddPen creates resources inside the InTouch view application that are not cleaned up when a window is closed during a view.exe session. To clean up these resources, you must use a call from a script to the ClearPens method, or close the view.exe session and end the runtime application.

### ClearPens

The ClearPens method removes all pens from the trend.

#### Example

```
dim b as boolean;
b = Trend1.ClearPens();
```

#### Syntax

```
[Result=] Trend1.ClearPens();
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Parameters

None.

### Return Value

Returns TRUE if the pens were successfully deleted from the trend; otherwise, returns FALSE.

## DeleteCurrentPen

The DeleteCurrentPen method removes the currently selected pen from the trend.

### Example

```
dim b as boolean;
b = Trend1.DeleteCurrentPen();
```

### Syntax

```
[Result=] Trend1.DeleteCurrentPen();
```

### Parameters

None.

### Return Value

Returns TRUE if the pen was successfully removed; otherwise, returns FALSE.

## GetHistorianSource

GetHistorianSource method gets the named history source object for a server from the server list.

### Example

```
Dim b as object;
b = Trend1.GetHistorianSource("idc_insql15");
```

### Syntax

```
[Result =] Trend1.GetHistorianSource(string HistorySourceName);
```

### Parameters

*HistorySourceName*
The name of the history source.

### Return Value

If the server exists, the object is returned; otherwise, a NULL is returned.

## GetPenValAtX1

The GetPenValAtX1 method gets the value of the expression associated with the specified pen at the point at which its curve intersects the axis cursor the first time.

### Example

```
double val = Trend1.GetPenValAtX1("MyPen01");
```

### Syntax

```
[Result=] Trend1.GetPenValAtX1(string PenName);
```

### Parameters

*PenName*
The pen you want to check the value of.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Return Value

Returns a double if the point is analog or discrete; returns the fixed position of the point if the point is message or other type. If the specified pen is shown in the chart multiple times, then the method uses the first instance that was added.

## GetPenValAtX2

The GetPenValAtX2 method gets the value of the expression associated with the specified pen at the point at which its curve intersects the axis cursor the second time.

### Example

```
double val = Trend2.GetPenValAtX2("MyPen01");
```

### Syntax

```
[Result=] Trend2.GetPenValAtX2(string PenName);
```

### Parameters

*PenName*
The pen you want to check the value of.

### Return Value

Returns a double if the point is analog or discrete; returns the fixed position of the point if the point is message or other type. If the specified pen is shown in the chart multiple times, then the method uses the first instance that was added.

## GetStartAndEndTimes

The GetStartAndEndTimes method gets the start and end times for the query.

### Example

```
Dim SDate as System.DateTime;
Dim EDate as System.DateTime;
Dim b as System.Int32
b = Trend1.GetStartAndEndTimes(SDate, EDate);
StartTime = SDate.ToString();
EndTime = EDate.ToString();
Ret = b;
```

### Syntax

```
[Result =] Trend1.GetStartAndEndTimes(DateTime StartTime, DateTime EndTime);
```

### Parameters

*StartTime*
The start time for the query.

*EndTime*
The end time for the query.

*Return Value*
Returns the time range enumeration.

## MoveNextPen

The MoveNextPen method sets the current pen focus to the next pen in the list of trended attributes or tags. If the current pen is the last pen, calling the MoveNextPen method sets the first pen as the current pen.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

**Example**

```
dim b as boolean;
b = Trend1.MoveNextPen();
```

**Syntax**

```
[Result=] Trend1.MoveNextPen();
```

**Parameters**

None.

**Return Value**

Returns TRUE if the current pen focus was successfully set to the next pen (or wrapped around to the first pen in the list); otherwise, returns FALSE.

### MovePrevPen

The MovePrevPen method sets the current pen focus to the previous pen in the list of trended attributes or tags. If the current pen is the first pen, calling the MovePrevPen method has no effect.

**Example**

```
dim b as boolean;
b = Trend1.MovePrevPen();
```

**Syntax**

```
[Result=] Trend1.MovePrevPen();
```

**Parameters**

None.

**Return Value**

Returns TRUE if the current pen focus was successfully set to the previous pen; otherwise, returns FALSE.

### RefreshData

The RefreshData method refreshes the trend chart by retrieving new data for all pens.

**Example**

```
bool b = Trend1.RefreshData();
```

**Syntax**

```
[Result=] Trend1.RefreshData();
```

**Parameters**

None.

**Return Value**

Returns TRUE if the trend was successfully updated; otherwise, FALSE is returned.

### RefreshTimes

The RefreshTimes method sets the time period for the query by updating the end time to current time and recalculates the start time based on the new end time and duration.

**Example**

```
dtag = 1;
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

```
Trend1.RefreshTimes(dtag);
```

**Syntax**

```
Trend1.RefreshTimes(bool TriggerEvent);
```

**Parameters**

*TriggerEvent*

If you set the Boolean parameter to TRUE, the OnChange event is triggered if the time is updated.

### RemoveHistorianSource

RemoveHistorianSource method removes the specified history source from the list.

**Example**

```
Dim b as Boolean;
b = Trend1.RemoveHistorianSource("IDC_INSQL15");
```

**Syntax**

```
[Result] = Trend1.RemoveHistorianSource(string HistorySourceName);
```

**Parameters**

*HistorySourceName*
The name of the history source.

*Return Value*
This method returns true if the instance was removed from the list. This method returns false if the exact instance is not in the list, and the list remains unchanged.

### RemovePen

The RemovePen method removes the specified pen from the trend chart.



**Note:** If the same pen is available multiple times, then only the first occurrence is removed.



**Example**

```
dim b as boolean;
b = Trend1.RemovePen("MyPen01");
```

**Syntax**

```
[Result=] Trend1.RemovePen(string PenName);
```

**Parameters**

*PenName*
The pen name to be removed.

**Return Value**

Returns TRUE if the pen was successfully removed from the trend chart; otherwise, returns FALSE.

### ScaleAllPens

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

The ScaleAllPens method sets the Y-axis (value axis) scale for all pens.

**Example**

```
dim b as boolean;
b = Trend1.ScaleAllPens(-100, 100);
```

**Syntax**

```
[Result=] Trend1.ScaleAllPens(double Min, double Max);
```

**Parameters**

*Min*
Type the minimum value for the Y-axis.

*Max*
Type the maximum value for the Y-axis.

**Return Value**

Returns TRUE if the Y-axis scale is set successfully; otherwise, returns FALSE.

### ScaleAutoAllPens

The ScaleAutoAllPens method sets a suitable Y-axis scale for all tags in accordance with the current minimum and maximum values.

**Example**

```
dim b as boolean;
b = Trend1.ScaleAutoAllPens();
```

**Syntax**

```
[Result=] Trend1.ScaleAutoAllPens();
```

**Parameters**

None.

**Return Value**

Returns TRUE if the Y-axis is successfully scaled; otherwise, returns FALSE.

### ScaleAutoPen

The ScaleAutoPen method sets a suitable Y-axis scale for the currently selected pen in accordance with the current minimum and maximum values.

**Example**

```
dim b as boolean;
b = Trend1.ScaleAutoPen();
```

**Syntax**

```
[Result=] Trend1.ScaleAutoPen();
```

**Parameters**

None.

**Return Value**

Returns TRUE if the Y-axis is successfully scaled; otherwise, returns FALSE.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### ScaleDownAllPens

The ScaleDownAllPens method increases the value range of all pens by one third.

**Example**

```
dim b as boolean;
b = Trend1.ScaleDownAllPens();
```

**Syntax**

```
[Result=] Trend1.ScaleDownAllPens();
```

**Parameters**

None.

**Return Value**

Returns TRUE if the value range is successfully increased by one third; otherwise, returns FALSE.

### ScaleDownPen

The ScaleDownPen method increases the value range of the currently selected pen by one third.

**Example**

```
dim b as boolean;
b = Trend1.ScaleDownPen();
```

**Syntax**

```
[Result=] Trend1.ScaleDownPen();
```

**Parameters**

None.

**Return Value**

Returns TRUE if the scaling is successful; otherwise, returns FALSE.

### ScaleMoveAllPensDown

The ScaleMoveAllPensDown method moves the value scale down for all pens.

**Example**

```
dim b as boolean;
b = Trend1.ScaleMoveAllPensDown();
```

**Syntax**

```
[Result=] Trend1.ScaleMoveAllPensDown();
```

**Parameters**

None.

**Return Value**

Returns TRUE if the scaling is successful; otherwise, returns FALSE.

### ScaleMoveAllPensUp

The ScaleMovesAllPensUp method moves the value scale up for all pens.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

**Example**

```
dim b as boolean;
b = Trend1.ScaleMoveAllPensUp();
```

**Syntax**

```
[Result=] Trend1.ScaleMoveAllPensUp();
```

**Parameters**

None.

**Return Value**

Returns TRUE if the scaling is successful; otherwise, returns FALSE.

### ScaleMovePenDown

The ScaleMovePenDown method moves the value scale down for the currently selected pen.

**Example**

```
dim b as boolean;
b = Trend1.ScaleMovePenDown();
```

**Syntax**

```
[Result=] Trend1.ScaleMovePenDown();
```

**Parameters**

None.

**Return Value**

Returns TRUE if the scaling is successful; otherwise, returns FALSE.

### ScaleMovePenUp

The ScaleMovePenUp method moves the value scale up for the currently selected pen.

**Example**

```
dim b as boolean;
b = Trend1.ScaleMovePenUp();
```

**Syntax**

```
[Result=] Trend1.ScaleMovePenUp();
```

**Parameters**

None.

**Return Value**

Returns TRUE if the scaling is successful; otherwise, returns FALSE.

### ScalePen

The ScalePen method sets the Y-axis scale for the currently selected pen.

**Example**

```
dim b as boolean;
b = Trend1.ScalePen(-100, 100);
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Syntax

```
[Result=] Trend1.ScalePen(double Min, double Max);
```

### Parameters

*Min*
Type the minimum value for the Y-axis.

*Max*
Type the maximum value for the Y-axis.

### Return Value

Returns TRUE if the Y-axis scale is set successfully; otherwise, returns FALSE.

## ScaleUpAllPens

The ScaleUpAllPens method decreases the value range of all pens by one fourth.

### Example

```
dim b as boolean;
b = Trend1.ScaleUpAllPens();
```

### Syntax

```
[Result=] Trend1.ScaleUpAllPens();
```

### Parameters

None.

### Return Value

Returns TRUE if the value range is successfully reduced by one fourth; otherwise, returns FALSE.

## ScaleUpPen

The ScaleUpPen method decreases the value range of the currently selected pen by one fourth.

### Example

```
dim b as boolean;
b = Trend1.ScaleUpPen();
```

### Syntax

```
[Result=] Trend1.ScaleUpPen();
```

### Parameters

None.

### Return Value

Returns TRUE if the value range is successfully reduced by one fourth; otherwise, returns FALSE.

## SetCurrentPen

The SetCurrentPen method sets the specified pen as the currently selected pen. If the pen is available multiple times, then the first occurrence is selected.

### Example

```
dim b as boolean;
b = Trend1.SetCurrentPen("MyPen01");
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Syntax

```
[Result=] Trend1.SetCurrentPen(string PenName);
```

### Parameters

*PenName*
The name of the pen being set.

### Return Value

Returns TRUE if the pen was set successfully; otherwise, returns FALSE.

## SetDuration

The SetDuration method sets the duration of the trend. Calling this method first sets the end time to the current time and then the start time to current time minus the specified duration. Default duration is 5 minutes. Maximum duration is 24 hours.

### Example

```
dim b as boolean;
b = Trend1.SetDuration("00:05:00");
```

### Syntax

```
[Result=] Trend1.SetDuration(string DateTimeDuration);
```

### Parameters

*DateTimeDuration*
The time of the duration in HH:MM:SS format.

### Return Value

Returns TRUE if the duration is set successfully; otherwise, returns FALSE.

## SetStartAndEndTimes

The SetStartAndEndTimes method sets the start and end times for the query.

### Example

```
Dim b as Boolean;
b = Trend1.SetStartAndEndTimes("08/31/2008 15:33:43","09/01/2009 15:33:43",0);
```

### Syntax

```
[Result =] Trend1.SetStartAndEndTimes(DateTime StartTime, DateTime EndTime, integer
Duration);
```

### Parameters

*StartTime*
The start time for the query. Only considered if the duration is set to Custom. For other durations, the start time is calculated automatically based on the end time and duration.

*EndTime*
The end time for the query. Only considered if the duration is set to Custom or an option from 17 to 32 (OneMinute to ThreeMonths). Otherwise, the end time is set based on the duration.

*Duration*

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

The time1 range duration. If the duration is set to Custom, the specified start and end times are used. For other duration options, the time indicated by the duration is used, and the start and/or end times are updated as necessary. For more information on valid values for the duration, see "TimeSelector.TimeDuration".

### TimeSelector.GetStartAndEndTimes

The TimeSelector.GetStartAndEndTimes method gets the start and end times for the query.

#### Syntax

```
Trend01.GetStartAndEndTimes(DateTime StartTime, DateTime EndTime);
```

#### Parameters

*StartTime*
String attribute, custom property, or element property to retrieve the start time.

*EndTime*
String attribute, custom property, or element property to retrieve the end time.

#### Example

```
dim SDate as string;
dim EDate as string;
Trend01.TimeSelector.GetStartAndEndTimes(SDate, EDate);
StartDate = SDate;
EndDate = EDate;
```

### TimeSelector.RefreshTimes

The TimeSelector.RefreshTimes method sets the time period for the query by updating the end time to current time and recalculates the start time based on the new end time and duration.

If you set the Boolean parameter to TRUE, the OnChange event is triggered if the time is updated.

Only use this method if the **Update to Current Time** option is cleared or the **UpdateToCurrentTime** property is FALSE. Otherwise, this method does not work.





#### Syntax

```
Trend01.TimeSelector.RefreshTimes(TriggerEvent);
```

#### Example

```
dtag = 1;
Trend01.TimeSelector.RefreshTimes(dtag);
```

### TimeSelector.SetStartAndEndTimes

The TimeSelector.SetStartAndEndTimes method sets the start and end times for the query.

You must specify one of the following parameter combinations:

- Start time and end time. Set the Duration parameter to Custom (0).
- Start time and duration. Set the EndTime parameter to "".
- End time and duration. Set the StartTime parameter to "".

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- Start time, duration, and end time. The Trend Client shows an error message if start time plus duration is not equal to end time.

**Syntax**

```
Trend01.SetStartAndEndTimes(DateTime StartTime, DateTime EndTime, integer Duration);
```

**Parameters**

*StartTime*
The start time for the query. Only considered if the duration is set to Custom (0) by the Duration parameter. For other durations, the start time is calculated automatically based on the end time and duration.

*EndTime*
The end time for the query. Only considered if the duration is set to Custom or an option from 17 to 32 (OneMinute to ThreeMonths) by the Duration parameter. Otherwise, the end time is set based on the duration.

*Duration*
Duration enum. For more information on possible duration values, see "TimeSelector.TimeDuration".

**Example**

```
Trend01.TimeSelector.SetStartAndEndTimes("08/31/2008 15:33:43","09/01/2009 15:33:43",0);
```

### UpdateHistorianSource

UpdateHistorianSource method updates the specified history source in the list.

**Example**

```
Dim a as object;
Dim b as Boolean;
a = Trend1.GetHistorianSource ("IDC_INSQL15");
a.Authentication = "Windows Integrated";
b = Trend1.UpdateHistorianSource("IDC_INSQL15");
```

**Syntax**

```
[Result =] Trend1.UpdateHistorianSource(string HistorySourceName);
```

**Parameters**

*HistorySourceName*
The name of the history source.

*Return Value*
Returns TRUE if the given instance is currently in the server list; otherwise, it returns FALSE.

## Trend Client Events

The following events are relevant to the Trend Client.

- CurrentPenChanged
- DatesChanged
- MouseClick
- PenDisplayChanged
- PenlistChanged
- ShutDown

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- SizeChanged
- StartUp
- StateChanged

### CurrentPenChanged

The CurrentPenChanged event is triggered when a different pen is selected.

**Syntax**

```
TrendClient.CurrentPenChanged();
```

### DatesChanged

The DatesChanged event is triggered when a date/time for the trend chart changes because there is a scripted change to the chart's duration.

**Syntax**

```
TrendClient.DatesChanged();
```

### MouseClick

The MouseClick event is triggered when there is a mouse click in the trend region.

**Syntax**

```
TrendClient.MouseClick();
```

### PenDisplayChanged

The PenDisplayChanged event is triggered when the display options for a pen in the pen list are changed.

**Syntax**

```
TrendClient.PenDisplayChanged();
```

### PenlistChanged

The PenlistChanged event is triggered when a pen is added to or removed from the pen list.

**Syntax**

```
TrendClient.PenlistChanged();
```

### ShutDown

The ShutDown event is triggered when the client is closed.

**Syntax**

```
TrendClient.ShutDown();
```

### SizeChanged

The SizeChanged event is triggered when a resize event is received.

**Syntax**

```
TrendClient.SizeChanged();
```

### StartUp

The StartUp event is triggered when the client is started.

**Syntax**

```
TrendClient.StartUp();
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### StateChanged

The StateChanged event is triggered when a change has been made to the configuration for a pen in the pen list.

**Syntax**

```
TrendClient.StateChanged();
```

## Colors in Trend Client

Trend Client and ActiveFactory use different color rendering schemes. ActiveFactory uses BGR and ABGR color rendering,

where:

A = Transparency (for ABGR only)

B = Blue

G = Green

R = Red

Information on how colors are rendered in ActiveFactory appears in Chapter 19, Common Properties, Methods, Events, Enums, and Data Types, of the ActiveFactory Software User's Guide.

In contrast, in the Trend Client, color is a .NET Framework data type. You can use various color methods to set the color, such as a predefined color name, FromARGB(), FromKnownColor(), and FromName(). For example, to set the pen color on a Trend Client Trend named **RealtimeTrend1** to **DarkGreen**, you use the following script statement:

```
RealtimeTrend1.Pen.Color = System.Drawing.Color.FromName("DarkGreen");
```

For more information on the color methods, see the Microsoft documentation for .NET Framework development.

## .NET Colors

The following table is an overview of the color .NET color names with hexadecimal code.

| Color with Hex Code | Color with Hex Code | Color with Hex Code |
|---|---|---|
| AliceBlue #F0F8FF | AntiqueWhite #FAEBD7 | Aqua #00FFFF |
| Aquamarine #7FFFD4 | Azure #F0FFFF | Beige #F5F5DC |
| Bisque #FFE4C4 | Black #000000 | BlanchedAlmond #FFEBCD |
| Blue #0000FF | BlueViolet #8A2BE2 | Brown #A52A2A |
| BurlyWood #DEB887 | CadetBlue #5F9EA0 | Chartreuse #7FFF00 |
| Chocolate #D2691E | Coral #FF7F50 | CornflowerBlue #6495ED |
| Cornsilk #FFF8DC | Crimson #DC143C | Cyan #00FFFF |
| DarkBlue #00008B | DarkCyan #008B8B | DarkGoldenrod #B8860B |
| DarkGray #A9A9A9 | DarkGreen #006400 | DarkKhaki #BDB76B |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Color with Hex Code | Color with Hex Code | Color with Hex Code |
|---|---|---|
| DarkMagenta #8B008B | DarkOliveGreen #556B2F | DarkOrange #FF8C00 |
| DarkOrchid #9932CC | DarkRed #8B0000 | DarkSalmon #E9967A |
| DarkSeaGreen #8FBC8B | DarkSlateBlue #483D8B | DarkSlateGray #2F4F4F |
| DarkTurquoise #00CED1 | DarkViolet #9400D3 | DeepPink #FF1493 |
| DeepSkyBlue #00BFFF | DimGray #696969 | DodgerBlue #1E90FF |
| Firebrick #B22222 | FloralWhite #FFFAF0 | ForestGreen #228B22 |
| Fuchsia #FF00FF | Gainsboro #DCDCDC | GhostWhite #F8F8FF |
| Gold #FFD700 | Goldenrod #DAA520 | Gray #808080 |
| Green #008000 | GreenYellow #ADFF2F | Honeydew #F0FFF0 |
| HotPink #FF69B4 | IndianRed #CD5C5C | Indigo #4B0082 |
| Ivory #FFFFF0 | Khaki #F0E68C | Lavender #E6E6FA |
| LavenderBlush #FFF0F5 | LawnGreen #7CFC00 | LemonChiffon #FFFACD |
| LightBlue #ADD8E6 | LightCoral #F08080 | LightCyan #E0FFFF |
| LightGoldenrodYellow #FAFAD2 | LightGray #D3D3D3 | LightGreen #90EE90 |
| LightPink #FFB6C1 | LightSalmon #FFA07A | LightSeaGreen #20B2AA |
| LightSkyBlue #87CEFA | LightSlateGray #778899 | LightSteelBlue #B0C4DE |
| LightYellow #FFFFE0 | Lime #00FF00 | LimeGreen #32CD32 |
| Linen #FAF0E6 | Magenta #FF00FF | Maroon #800000 |
| MediumAquamarine #66CDAA | MediumBlue #0000CD | MediumOrchid #BA55D3 |
| MediumPurple #9370DB | MediumSeaGreen #3CB371 | MediumSlateBlue #7B68EE |
| MediumSpringGreen #00FA9A | MediumTurquoise #48D1CC | MediumVioletRed #C71585 |
| MidnightBlue #191970 | MintCream #F5FFFA | MistyRose #FFE4E1 |
| Moccasin #FFE4B5 | NavajoWhite #FFDEAD | Navy #000080 |
| OldLace #FDF5E6 | Olive #808000 | OliveDrab #6B8E23 |
| Orange #FFA500 | OrangeRed #FF4500 | Orchid #DA70D6 |
| PaleGoldenrod #EEE8AA | PaleGreen #98FB98 | PaleTurquoise #AFEEEE |
| PaleVioletRed #DB7093 | PapayaWhip #FFEFD5 | PeachPuff #FFDAB9 |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Color with Hex Code | Color with Hex Code | Color with Hex Code |
|---|---|---|
| Peru #CD853F | Pink #FFC0CB | Plum #DDA0DD |
| PowderBlue #B0E0E6 | Purple #800080 | Red #FF0000 |
| RosyBrown #BC8F8F | RoyalBlue #4169E1 | SaddleBrown #8B4513 |
| Salmon #FA8072 | SandyBrown #F4A460 | SeaGreen #2E8B57 |
| SeaShell #FFF5EE | Sienna #A0522D | Silver #C0C0C0 |
| SkyBlue #87CEEB | SlateBlue #6A5ACD | SlateGray #708090 |
| Snow #FFFAFA | SpringGreen #00FF7F | SteelBlue #4682B4 |
| Tan #D2B48C | Teal #008080 | Thistle #D8BFD8 |
| Tomato #FF6347 | Transparent #FFFFFF | Turquoise #40E0D0 |
| Violet #EE82EE | Wheat #F5DEB3 | White #FFFFFF |
| WhiteSmoke #F5F5F5 | Yellow #FFFF00 | YellowGreen #9ACD32 |

## Scripting Differences between Trend Client and ActiveFactory Trend Control

The Trend Client maintains the same support for run-time reference binding as all Industrial graphic elements.

The Trend Client properties and methods are very similar to the ActiveFactory Trend control properties and methods, as shown in the following table:

| ActiveFactory Trend property or method | Trend Client property or method |
|---|---|
| (no equivalent) | "AddHistorianSource" |
| AddTag | AddPen |
| AddMultipleTags | Chart.AddMultiplePens |
| BackColor | Chart.BackgroundColor |
| (no equivalent) | Chart.Freeze |
| (no equivalent) | Chart.FreezeDurationMS |
| (no equivalent) | Chart.HidePenList |
| (no equivalent) | "Chart.Labels" |
| DefaultTagPrecision | Chart.PenPrecision |
| (no equivalent) | Chart.RefreshEntireChartIntervals |
| RetrievalOptionsRetrievalMode | Chart.RetrievalMode |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| ActiveFactory Trend property or method | Trend Client property or method |
|---|---|
| LiveModeRate | Chart.UpdateRateMS |
| ClearTags | ClearPens |
| DeleteCurrentTag | DeleteCurrentPen |
| (no equivalent) | "GetHistorianSource" |
| CurrentTagValAtX1 | GetPenValAtX1 |
| (no equivalent) | "GetStartAndEndTimes |
| (no equivalent) | HistorySource.Authentication |
| (no equivalent) | HistorySource.Connect |
| (no equivalent) | HistorySource.Disconnect |
| (no equivalent) | HistorySource.Domain |
| (no equivalent) | HistorySource.Password |
| (no equivalent) | HistorySource.RetainPassword |
| (no equivalent) | HistorySource.ServerName |
| (no equivalent) | HistorySource.Type |
| (no equivalent) | HistorySource.UNCPath |
| (no equivalent) | HistorySource.UserID |
| Servers | HistorySources |
| (no equivalent) | HistorySources.Add |
| (no equivalent) | HistorySources.Count |
| (no equivalent) | HistorySources.GetSource |
| (no equivalent) | "HistorySources.Items" |
| (no equivalent) | HistorySources.Remove |
| (no equivalent) | HistorySources.Update |
| MoveNextTag | MoveNextPen |
| MovePrevTag | MovePrevPen |
| CurrentTagColor | Pen.Color |
| (no equivalent) | Pen.Count |
| (no equivalent) | Pen.Description |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| ActiveFactory Trend property or method | Trend Client property or method |
|---|---|
| (no equivalent) | Pen.Expression |
| CurrentTagFormat | Pen.Format |
| (no equivalent) | Pen.HistorySource |
| (no equivalent) | Pen.HistoryTagName |
| CurrentTagIndex | Pen.Index |
| (no equivalent) | Pen.Name |
| (no equivalent) | "Pen.Precision" |
| CurrentTagPrecision | Pen.RetrievalMode |
| CurrentTagRetrievalStyle | Pen.Style |
| (no equivalent) | Pen.TrendHi |
| (no equivalent) | Pen.TrendLo |
| CurrentTagTrendType | Pen.TrendType |
| (no equivalent) | Pen.Units |
| (no equivalent) | Pen.Visible |
| CurrentTagPenWidth | Pen.Width |
| CurrentTagRetrievalMode | PenSelectorHeight |
| (no equivalent) | PenUQRelativeOpacity |
| (no equivalent) | PenUQRelativeThickness |
| BackColor | PlotArea.BackgroundColor |
| BorderColor | PlotArea.BorderColor |
| PlotGradientEndColor | PlotArea.GradientEndColor |
| PlotGradient | PlotArea.GradientType |
| GridColor | PlotArea.GridColor |
| GridHorizontal | PlotArea.GridHorizontal |
| (no equivalent) | PlotArea.GridStyle |
| GridVertical | PlotArea.GridVertical |
| (no equivalent) | PlotArea.GridWidth |
| HighlightCurrentTag | PlotArea.HighlightCurrentPen |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| ActiveFactory Trend property or method | Trend Client property or method |
|---|---|
| (no equivalent) | PlotArea.PenHighlightColor |
| (no equivalent) | PlotArea.PenHighlightWidth |
| SingleTagMode | PlotArea.SingleTagMode |
| PlotImage | PlotImage |
| RefreshData | RefreshData |
| (no equivalent) | "RefreshTimes" |
| (no equivalent) | "RemoveHistorianSource" |
| RemoveTag | RemovePen |
| ScaleAllTags | ScaleAllPens |
| ScaleAutoAllTags | ScaleAutoAllPens |
| ScaleAutoTag | ScaleAutoPen |
| ScaleDownAllTags | ScaleDownAllPens |
| ScaleDownTag | ScaleDownPen |
| ScaleMoveAllTagsDown | ScaleMoveAllPensDown |
| ScaleMoveAllTagsUp | ScaleMoveAllPensUp |
| ScaleMoveTagDown | ScaleMovePenDown |
| ScaleMoveTagUp | ScaleMovePenUp |
| ScaleTag | ScalePen |
| ScaleUpAllTags | ScaleUpAllPens |
| ScaleUpTag | ScaleUpPen |
| SetCurrentTag | SetCurrentPen |
| SetDuration | SetDuration |
| (no equivalent) | "SetStartAndEndTimes" |
| AllowContextMenu | ShowContextMenu |
| SupressErrors | SuppressErrors |
| XCursor1Color | TimeAxis.Cursor1.Color |
| XCursor1Pos | TimeAxis.Cursor1.Pos |
| (no equivalent) | TimeAxis.Cursor1.Style |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| ActiveFactory Trend property or method | Trend Client property or method |
|---|---|
| (no equivalent) | TimeAxis.Cursor1.Width |
| XCursor2Color | TimeAxis.Cursor2.Color |
| XCursor2Pos | TimeAxis.Cursor2.Pos |
| (no equivalent) | TimeAxis.Cursor2.Style |
| (no equivalent) | TimeAxis.Cursor2.Width |
| NumDataPointLabels | TimeAxis.LabelColor |
| NumTimeAxisGridPerValue | TimeAxis.NumGridPerValue |
| NumTimeAxisValues | TimeAxis.NumValues |
| (no equivalent) | TimeAxis.ShowCursors |
| (no equivalent) | "TimeSelector" |
| (no equivalent) | "TimeSelector.DurationMS" |
| (no equivalent) | "TimeSelector.EndDate" |
| (no equivalent) | "TimeSelector.GetStartAndEndTimes" |
| (no equivalent) | "TimeSelector.RefreshTimes" |
| (no equivalent) | "TimeSelector.SetStartAndEndTimes" |
| (no equivalent) | "TimeSelector.StartDate" |
| TimeSelector.TimeDuration | TimeSelector.TimeDuration |
| ToolTipText | ToolTipText |
| (no equivalent) | TrendVersion |
| (no equivalent) | "UpdateHistorianSource" |
| NumXValueAxisLabels | ValueAxis.Label |
| NumYAxisGridPerValue | ValueAxis.NumGridPerValue |
| NumYAxisValues | ValueAxis.NumValues |
| Visible | Visible |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Understanding Data Retrieval

The Trend Client supports both Cyclic and Full retrieval modes when retrieving data from Historian. This appendix explains how both retrieval modes work.

## Understanding Retrieval Modes

Different retrieval modes enable you to access data stored on an Historian in different ways. For example, if you retrieve data over a long trend duration, you can use equal length data collection intervals to minimize response time. For a shorter period, you might want to retrieve all stored values to produce more accurate trends.

Although Historian with a version of 9.0 or higher supports a variety of retrieval modes, the Trend Client only supports Cyclic and Full data retrieval.

### Cyclic Retrieval

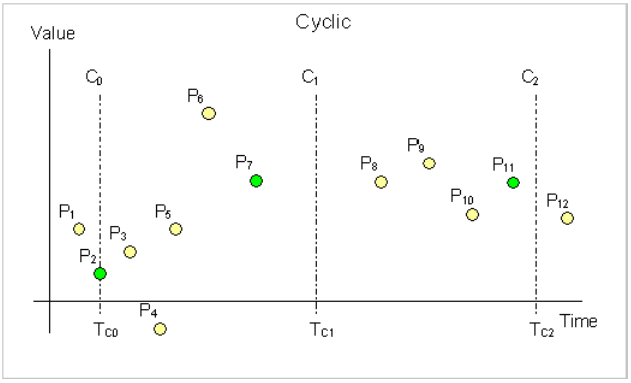
Cyclic retrieval mode returns stored data over a trend duration at equal length cyclic intervals. In Cyclic retrieval mode, a single value is returned at the beginning of each cyclic interval.

If no data is stored at the start of a cyclic interval, the last recorded value before the start of an interval is returned. If two consecutive intervals have the same value, no value is returned for the second interval.

Cyclic retrieval works with all types of tags and produces a virtual rowset, which may or may not correspond to the actual data rows stored on the Historian.

The length of a cyclic interval is dynamic and determined by the duration of a trend and the resolution of a trend in pixels: 1 cyclic interval for every 2 pixels.

The following graph shows how tag values are retrieved from the Historian using Cyclic retrieval mode.




Data is retrieved over a period starting at $T_{C0}$ and an ending at $T_{C2}$. Each dot in the graph represents an actual data point stored in the Historian. The Historian can return data from three cyclic intervals at $T_{C0}$, $T_{C1}$, and $T_{C2}$.

The following data points are returned by Cyclic retrieval mode:

- At $T_{C0}$: $P_2$, because it falls on the start boundary of an interval
- At $T_{C1}$: $P_7$, because it is the last data point before the start of the next cyclic interval
- At $T_{C2}$: none because P7 and P11 are the same value

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

Cyclic retrieval mode is fast and consumes little Historian resources. However, cyclic retrieval mode may not accurately reflect stored data because important process values (data gaps, value spikes) may fall outside of the retrieval intervals and not appear as values shown in the trend.

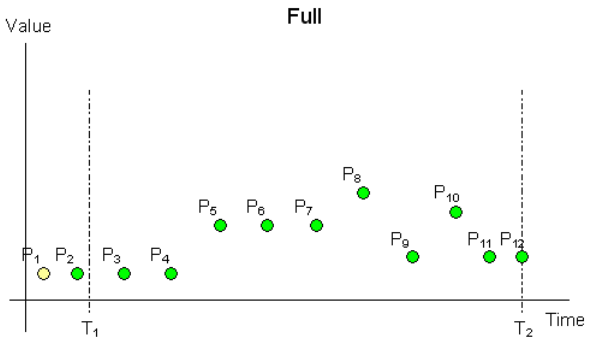
### Full Retrieval

In Full retrieval mode, all stored data points are returned, regardless of whether a value or quality has changed since the last value. This mode enables the same value and quality pair (or NULL value) to be returned consecutively with their actual timestamps. It works with all types of tags.

By using Full retrieval in conjunction with storage without filtering (that is, no delta or cyclic storage mode is applied at the historian), you can retrieve all values that originated from the plant floor data source or from another application.

Full retrieval best represents the process measurements recorded by the Historian. However, it imposes a higher load on the server, the network, and the client system because a very large number of records may be returned for longer time periods.

The following illustration shows how values are returned for Full retrieval:




Data is retrieved in full mode with a start time of $T_1$ and an end time of $T_2$. Each dot in the graphic represents an actual data point stored on the historian. From these points, the following are returned:

- $P_2$, because there is no actual data point at $T_1$
- $P_3$ through $P_{12}$, because they represent stored data points during the time period

## Understanding Retrieval Modes

Different retrieval modes enable you to access data stored on an Historian in different ways. For example, if you retrieve data over a long trend duration, you can use equal length data collection intervals to minimize response time. For a shorter period, you might want to retrieve all stored values to produce more accurate trends.

Although Historian with a version of 9.0 or higher supports a variety of retrieval modes, the Trend Client only supports Cyclic and Full data retrieval.

### Cyclic Retrieval

Cyclic retrieval mode returns stored data over a trend duration at equal length cyclic intervals. In Cyclic retrieval mode, a single value is returned at the beginning of each cyclic interval.

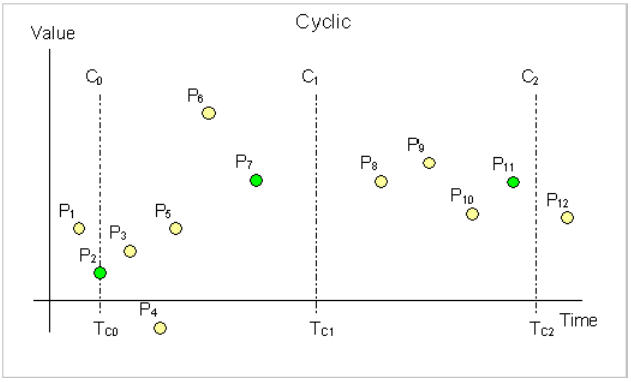
If no data is stored at the start of a cyclic interval, the last recorded value before the start of an interval is returned. If two consecutive intervals have the same value, no value is returned for the second interval.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

Cyclic retrieval works with all types of tags and produces a virtual rowset, which may or may not correspond to the actual data rows stored on the Historian.

The length of a cyclic interval is dynamic and determined by the duration of a trend and the resolution of a trend in pixels: 1 cyclic interval for every 2 pixels.

The following graph shows how tag values are retrieved from the Historian using Cyclic retrieval mode.




Data is retrieved over a period starting at $T_{C0}$ and an ending at $T_{C2}$. Each dot in the graph represents an actual data point stored in the Historian. The Historian can return data from three cyclic intervals at $T_{C0}$, $T_{C1}$, and $T_{C2}$.

The following data points are returned by Cyclic retrieval mode:

- At $T_{C0}$: $P_2$, because it falls on the start boundary of an interval
- At $T_{C1}$: $P_7$, because it is the last data point before the start of the next cyclic interval
- At $T_{C2}$: none because P7 and P11 are the same value

Cyclic retrieval mode is fast and consumes little Historian resources. However, cyclic retrieval mode may not accurately reflect stored data because important process values (data gaps, value spikes) may fall outside of the retrieval intervals and not appear as values shown in the trend.

### Full Retrieval

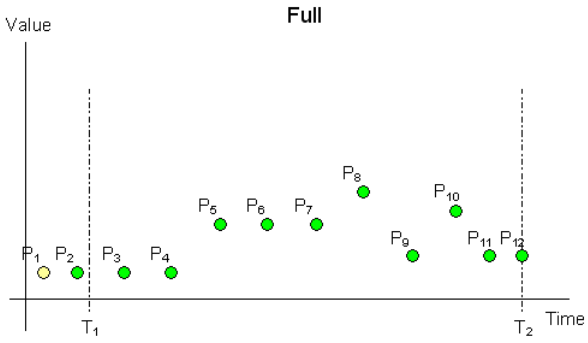
In Full retrieval mode, all stored data points are returned, regardless of whether a value or quality has changed since the last value. This mode enables the same value and quality pair (or NULL value) to be returned consecutively with their actual timestamps. It works with all types of tags.

By using Full retrieval in conjunction with storage without filtering (that is, no delta or cyclic storage mode is applied at the historian), you can retrieve all values that originated from the plant floor data source or from another application.

Full retrieval best represents the process measurements recorded by the Historian. However, it imposes a higher load on the server, the network, and the client system because a very large number of records may be returned for longer time periods.

The following illustration shows how values are returned for Full retrieval:

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




Data is retrieved in full mode with a start time of $T_1$ and an end time of $T_2$. Each dot in the graphic represents an actual data point stored on the historian. From these points, the following are returned:

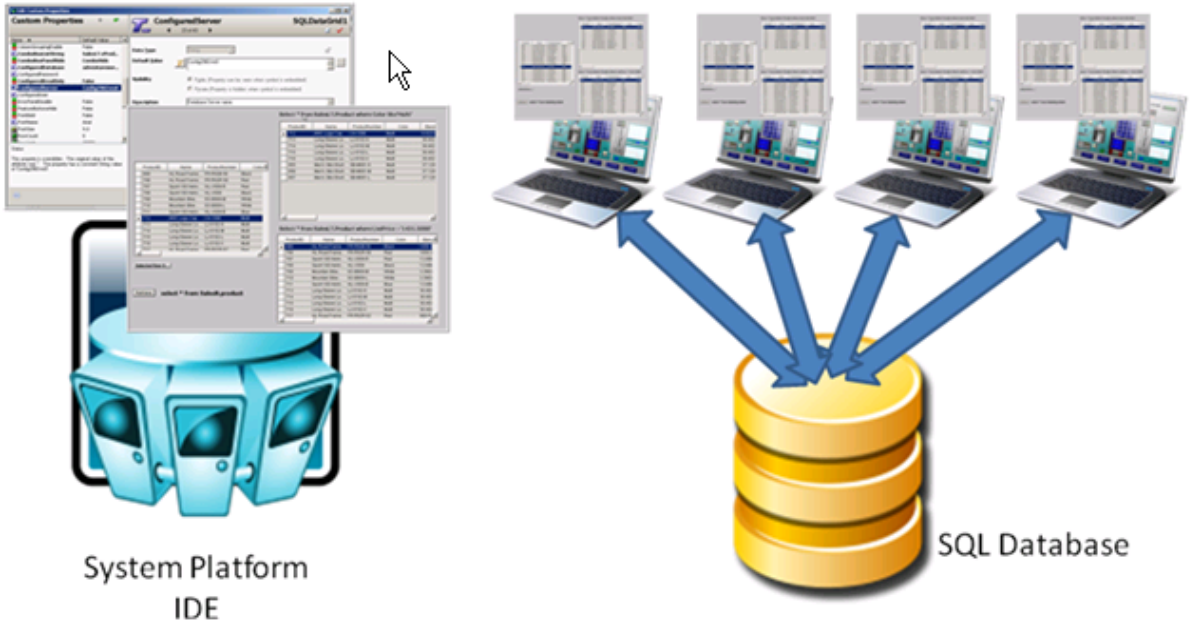
- $P_2$, because there is no actual data point at $T_1$
- $P_3$ through $P_{12}$, because they represent stored data points during the time period

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Chapter 18 The SQLDataGrid Graphic

The SQLDataGrid is a graphic that enables you to interact with data stored in SQL databases. You can use the SQLDataGrid graphic in an InTouch application that you create in a published or managed mode.

The following picture shows the main components associated with the SQLDataGrid.




You can perform the following activities with the SQLDataGrid graphic:

- Insert or modify data in selected database tables and views.
- Delete rows from a database table (select the row and press the **Delete** key).
- Select data from existing tables and views.
- Run a custom SQL query.

This section provides the following information:

- The minimum configuration required by the SQLDataGrid graphic to retrieve data from a SQL database.
- The set of custom properties that must be configured to authenticate users and connect to the database.
- A list of the custom properties that define the parameters associated with a specific database and query to be retrieved.

## Securely Accessing the SQL Data Grid

The SQL Data Grid is a powerful tool which allows InTouch WindowViewer to connect to various SQL databases. This tool allows for reading as well as modifying SQL databases, including their data, tables, table schemas, and stored procedures. Given this, it is important that the SQL Data Grid and any SQL database(s) it will access are configured securely.

**Security Best Practices**

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

1. Grant each user the least privileges required within each SQL database

   Grant users in the SQL database the least privileges required to accomplish their job. This can include limiting their access to specific databases as well as preventing modification to the database. The user should only have the privilege needed to perform their required actions. In the SQL Data Grid, the user will only be able to perform actions that their role allows them to. For SQL authentication and Windows impersonation, this is the user whose credentials have been provided to the SQL Data Grid. For Windows integrated authentication, this is the currently logged-on user.

2. Consider granting users read-only access within each SQL database

   Grant users read-only access in the SQL database when possible. This will prevent unwanted modification of the database. The SQL Data Grid can operate with a user who has read-only privilege and will only allow the user to retrieve and view the data.

3. Configure SQL Data Grid to use Windows Integrated Authentication

   Configuring the SQL Data Grid to use Windows integrated authentication helps to secure your application. Using SQL authentication and Windows impersonation require the storage of user credentials and increases the attack surface of the application. With Windows Integrated Security, the SQL Data Grid will connect to the SQL database using the context of the currently logged on Windows OS user.

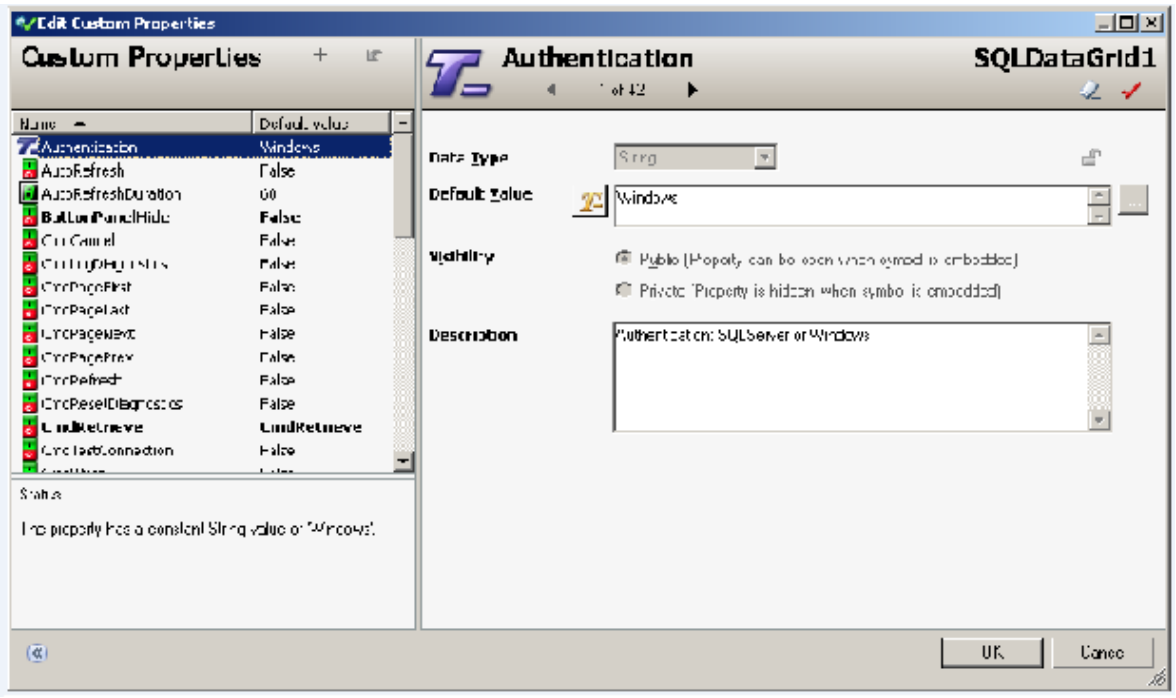
4. Be aware of what SQL Data Grid can do

   As an application developer/maintainer, it's your responsibility to be fully aware that the SQL Data Grid is not a read-only control, but instead it allows users to execute full SQL statements on the database, including UPDATE, CREATE, DROP, etc. There is a potential risk involved with using the SQL Data Grid if it, or the SQL database it is accessing are not configured securely.

## Using the SQLDataGrid Graphic

The SQLDataGrid graphic appears in the **Visualization** folder of the System Platform IDE. Embed the graphic in an existing window or a new window. When you double-click the graphic, the **Edit Custom Properties** dialog box appears.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




For detailed information on working with graphics, see the *ArchestrA and InTouch Integration Guide*.

## Configuring Authentication Modes

This section describes how to use the custom properties of the SQLDataGrid graphic to authenticate a user to the database. You can assign static values to these custom properties or link them to attributes or tag names in your application.

**Note:** The value fields are not case sensitive.

### To configure an authentication mode for the SQLDataGrid graphic

1. In the **Custom Properties** pane, select **Authentication**.
2. In the **Default Value** box, type the name of a valid security type. Acceptable values are:
   - Windows
   - SQL Server

   A more detailed description of these authentication modes follows this procedure.
3. In the **Custom Properties** pane, select **ConfiguredUser**.
4. In the **Default Value** box, type a user name.
5. In the **Custom Properties** pane, select **ConfiguredPassword**.
6. In the **Default Value** box, type the password associated with the user name.

### Windows Authentication

If you use Windows as a value for the **Authentication** custom property and do not designate custom properties for a domain, user, or password, the SQLDataGrid graphic uses the credentials of the user who is currently logged on to the node running InTouch.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

If you select Windows as a value for the **Authentication** custom property and designate custom properties for a domain, user, and password, the SQLDataGrid graphic uses the specified Windows domain name, user name, and password to connect to the SQL Server database.

### SQL Server

This authentication mode uses the specified SQL Server user name and password to connect to the SQL Server database.

## Configuring the Database Connection

This section describes the procedure to configure the custom properties required to establish a connection to a specific database and its associated data. You can assign static values to these custom properties or link them to attributes or tag names in your application.

**Note:** The value fields are not case sensitive.

If you are using a non-default port for the SQL Server database, see the SQLData Object help file for configuration information.

### To configure the database connection

1. In the **Custom Properties** pane, select **ConfiguredServer**.
2. In the **Default Value** box, type the network name of the computer hosting the database.
3. In the **Custom Properties** pane, select **ConfiguredDatabase**.
4. In the **Default Value** box, type the name of the target database.
5. In the **Custom Properties** pane, select **SQLQuery**.
6. In the **Default Value** box, type the name of the target table, view or query.

To populate the SQLDataGrid, click **Runtime**, and then click **Retrieve**.

## Configuring SQLDataGrid Graphic Custom Properties

This section lists custom properties in functional groups. For a detailed description of each custom property, see Custom Properties for the SQLDataGrid Graphic.

The default run-time window shows the complete graphic. However, you can hide the interface controls and display only the grid.

You can use custom properties to display additional information about the status of the query, the dataset, or to provide interactive buttons that initiate specific actions

In addition to the table, view, and query input, you can specify additional parameters by using custom properties and control them with scripting.

The following table lists the various custom properties you can insert in your scripts by functional groups.

| | |
|---|---|
| Authentication | Authenticate users to databases |
| | **Authentication** |
| | **ConfiguredDomain** |
| | **ConfiguredPassword** |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| | **ConfiguredUser** |
| Database Connectivity | Designate database connectivity functions |
| | **AutoRefresh** |
| | **AutoRefreshDuration** |
| | **CmdCancel** |
| | **CmdRefresh** |
| | **CmdRetrieve** |
| | **CmdTestConnection** |
| | **CmdWrite** |
| | **ComboBoxListString** |
| | **ConfiguredDatabase** |
| | **ConfiguredReadOnly** |
| | **ConfiguredServer** |
| | **RowCount** |
| | **RowLimit** |
| | **SelectedRowNumber** |
| | **SQLQuery** |
| | **SQLQueryCurrent** |
| | **SQLQueryPassThrough** |
| | **SQLQueryPending** |
| Diagnostic | Perform diagnostic functions |
| | **CmdLogDiagnostics** |
| | **CmdResetDiagnostics** |
| | **ErrorPanelDisable** |
| | **StatusDesc** |
| | **StatusError** |
| | **StatusIsError** |
| Appearance | Modify the appearance of the run-time SQLDataGrid that contains data from the database |
| | **ButtonPanelHide** |
| | **CmdPageFirst** |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

**CmdPageLast**

**CmdPageNext**

**CmdPagePrev**

**ColumnAggregateEnable**

**ColumnFiltering**

**ColumnGroupingEnable**

**ComboBoxPanelHide**

**FontBold**

**FontName**

**FontSize**

**SupportThemes**

**SuppressAuthenticationWarning**

**WriteButtonHide**

# Using Scripts with the SQLDataGrid

When you use the **SQLDataGridUserCtl** to create a new graphic, you can script all the properties and events of the control.

## Associating Grid Control Actions to InTouch Scripts and Animations

You can hide the buttons of the SQLDataGrid graphic and trigger data retrieval from outside the grid interface. For example, you can configure a button to generate a dataset from an InTouch application.

To do this, use the **CmdRetrieve** property and associate it to an InTouch tag. The tag is linked to the InTouch button.

### To configure dataset retrieval from InTouch

1. In WindowMaker, open the InTouch window.
2. Double-click the SQLDataGrid graphic. The **Edit Custom Property** dialog box appears.
3. In the **Custom Properties** panel, select the **ButtonPanelHide** property.
4. In the **Default Value** field, type **True**.
5. Select the **CmdRetrieve** property.
6. In the **Default Value** field, select an InTouch tag by one of the following actions:
   a. Type a tag name. If the tag does not exist, you are prompted to define a new tag.
   b. Click the ellipsis to open the Tagname Dictionary and select a tag.

   For this example, type **CmdRetrieve** in the field.
7. Click **OK** and define the tag as a Memory Discrete tag.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

8. When you finish defining the tag, close the Tagname Dictionary and click **OK** on the **Custom Properties** panel.
9. Create a button on your InTouch window. For this example, its caption is **Retrieve**.
10. Link the **CmdRetrieve** tag to the button.
11. Switch to run-time mode and click **Retrieve**.

## Accessing Data from a Selected Row in the SQLDataGrid

You can use the SQLDataGrid graphic to read the content of a selected row and associate it to attributes outside the graphic. You can configure scripts to read the data from a selected row and programmatically associate that data to tags in an InTouch application or to attributes in the Galaxy.

The following script example shows how to retrieve data from a selected row. Notice that the **SelectedRowData** property is available in the SQLDataGrid client control and not in the SQLDataGrid graphic.

```
dim rd1 as System.Data.DataRow;
rd1 = SQLDataGridUserCtrl1.SelectedRowData;
if(rd1 <> null) then
  InTouch:Text9 = rd1.ItemArray[4].ToString();
'This assigns the 4th column value for the selected row, to the InTouch "Text9" tag.
endif;
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Working with the SQLDataGrid in Run Time

During run time, you can select the database table, view, or query that will populate the SQLDataGrid graphic and change the appearance of the data.

You can use the run-time application to perform the following tasks:

- Move columns
- Group columns
- Aggregate column values
- Filter columns
- Sort columns

If you have the appropriate permissions, you can also make the following changes to the database:

- Change the order of columns in an existing row.
- Insert a row into a table.
- Update a row in a table.
- Delete a row from a table.

**Note:** You cannot update or delete a row in a table unless that table has a primary key defined. You can add new rows to a table without a primary key as long as that is the only action you are performing on the table.

## About Working with the SQLDataGrid in Run Time

During run time, you can select the database table, view, or query that will populate the SQLDataGrid graphic and change the appearance of the data.

You can use the run-time application to perform the following tasks:

- Move columns
- Group columns
- Aggregate column values
- Filter columns
- Sort columns

If you have the appropriate permissions, you can also make the following changes to the database:

- Change the order of columns in an existing row.
- Insert a row into a table.
- Update a row in a table.
- Delete a row from a table.

**Note:** You cannot update or delete a row in a table unless that table has a primary key defined. You can add new rows to a table without a primary key as long as that is the only action you are performing on the table.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

## Viewing Data

You can use the run-time version of the SQLDataGrid graphic to view data in the following formats:

- Data from a specific table
- Data from a specific view
- Data that is retrieved by a SQL query

You can resize the column width of any table, view, or query result.

### To view specific data from a SQL query

1. In the **Table, View or Query** box, type a SQL query.
2. Click **Retrieve**. The appropriate dataset appears.

### Populating the Table, View or Query List

You can also populate the Table, View or Query box with items that you frequently use, so that you do not repeatedly have to type entries.

**To populate the Table, View or Query box**

1. In the **Edit Custom Properties** dialog box, click **ComboBoxListString**.
2. In the **Default Value** box, type any of the following items, separated by semicolons (;):
   - Multiple table names
   - Multiple SQL statements
   - A combination of table names and SQL statements
3. Click **OK**.
4. When you go to run time, click the arrow to the right of the **Table, View or Query** box. Each item that you entered is displayed on a separate line.

### Solving Hide and Show Window Issues

If you hide the InTouch window that contains the SQLDataGrid and then show it again, the last data values contained in the window might not appear. Use the following procedure to ensure that the data values always appear.

**To Ensure that Grid Values Appear When You Hide and Show the InTouch WIndow**

1. In WindowMaker, click **Special > Configure > WindowViewer**.
2. Under **WindowViewer Memory**, clear the check box **Always load windows from disk**.

### Moving Columns

You can rearrange the order of the columns to meet your viewing needs.

### To move columns

1. Click the heading of the column that you want to move.
2. Holding your mouse key down, drag the column heading to another position within the table.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

## Grouping Columns

The group-by function lets you sort data at more specific levels. This example shows a view that groups customer names and their business addresses.

**Note:** The ColumnGroupingEnable custom property must be True before you can use this function.

### To use the Group-by function

1. In the **Table, View or Query** box, type the name of a table or view or click the arrow to display a list of pre-determined items. For details about pre-determined items, see Viewing Data.
2. Click **Group-by**. The **Drag a column header** area appears.

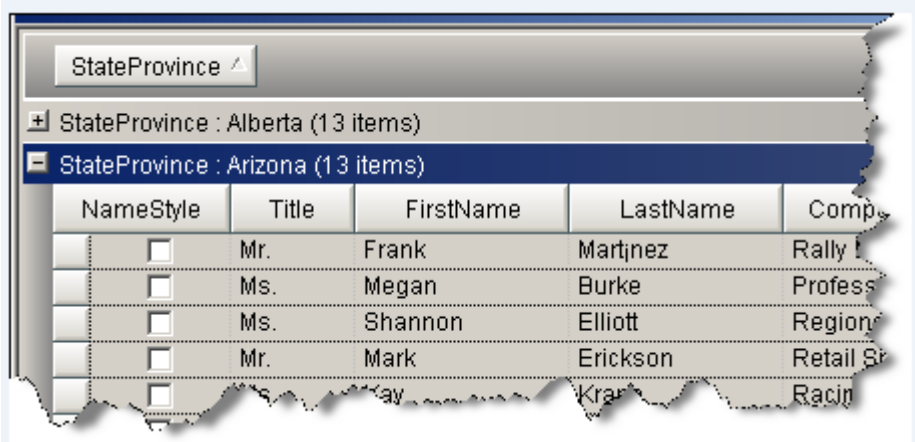



3. Drag a column heading to the upper area.




4. To view the data groups, press **Enter** to expand any of the **StateProvince** items.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




5. To see a more specific sorting of the data, drag another column heading to the upper sorting area.




6. If you want to sort the data at an even finer level, you can repeat steps 3 and 4 and drag another column heading to the sort area.
7. If you want to remove one of the column headings from the sorting area, drag it down to the data area.




8. To return the original dataset, click **Group-by**.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Viewing Aggregate Values

You can perform a numeric operation on data within a single column of the table by clicking the **Aggregate** button.

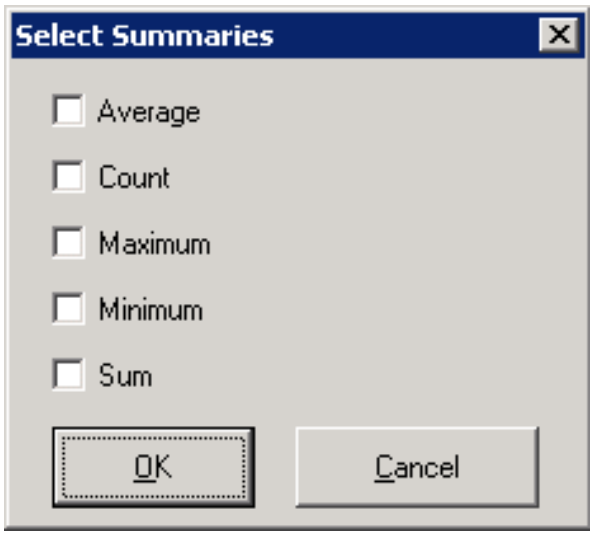
**Note:** Before you can use this function, the ColumnAggregateEnable custom property must be True.

You can perform the following functions on column data. Not all operations may be available for a column because of the data type.

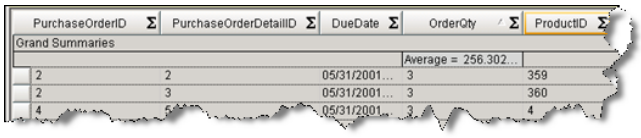
- Average: Calculates the average number of items in the column.
- Count: Lists the number of rows in the column.
- Maximum: Lists the highest number in the column.
- Minimum: Lists the lowest number in the column.
- Sum: Adds the numbers in each row and provides a total.

#### To view aggregate values

1. Click **Aggregate**. The summation sign (S) appears at the head of each column.
2. Click the summation sign at the top of the **OrderQty** column. The **Select Summaries** dialog box appears.




3. Select **Average** and click **OK**. The value appears just below the **Grand Summaries** row. You can re-size the column width to view the entire number This following figure shows the average value for **OrderQty**.




4. To hide the **Grand Summaries** row follow these steps:
   a. Click the summation sign.
   b. Clear the **Average** check box in the **Select Summaries** dialog box
   c. Click **OK**.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

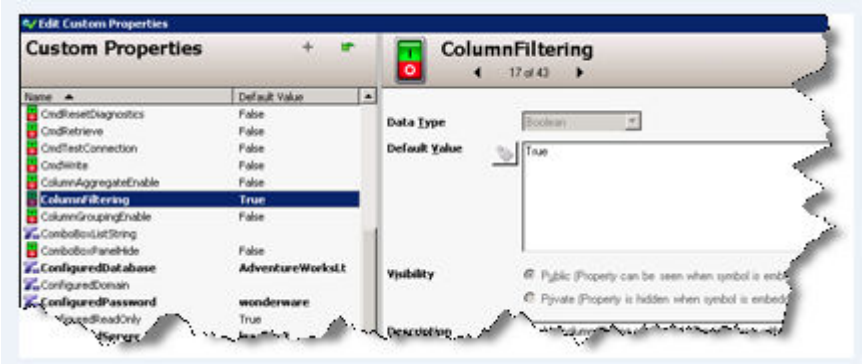
5. To hide the summation signs, click **Aggregate**.

### Using Progressive Column Filtering

You can configure the SQLDataGrid to support progressive column filtering. Type the first letters of your search, and the matching values appear in the grid.

#### To configure and use progressive filtering

1. Switch your SQLDataGrid window to WindowMaker mode.
2. Double-click the graphic and select the custom property **ColumnFiltering**.
3. Set the **ColumnFiltering** default value to **True**.

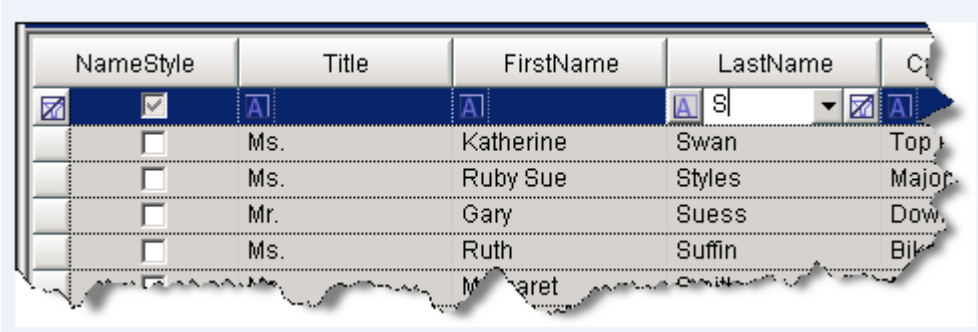



4. Click **OK** and run the InTouch application.
5. To return a dataset, click **Retrieve**. In this example, the dataset contains a table view of customer names and addresses.

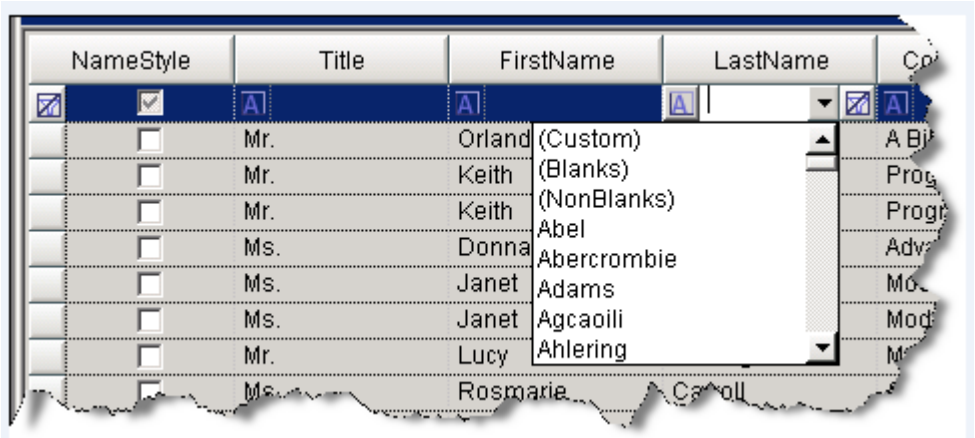



© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

6. Move your cursor over the field below the **LastName** column heading. A list arrow appears.
7. You can filter the values by any of the following actions:
   - Click the list arrow and type the first letter of the value If you type additional letters, your sort is more precise.

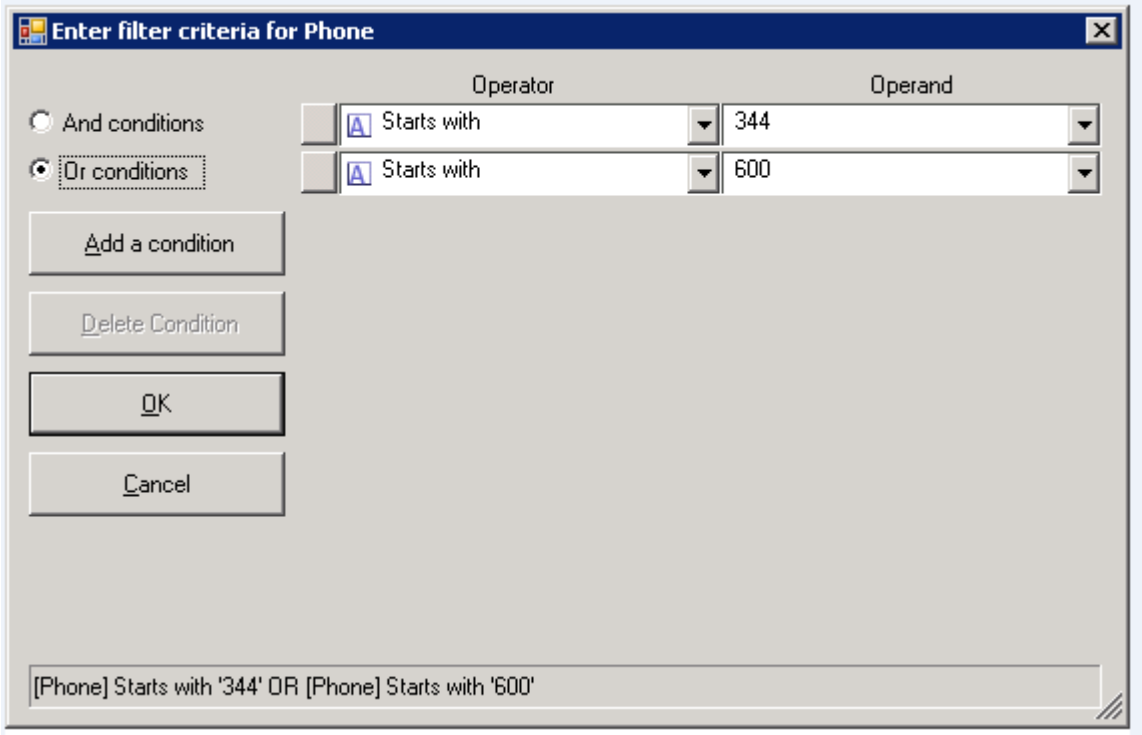



   - Click the list arrow and select an item from the list.

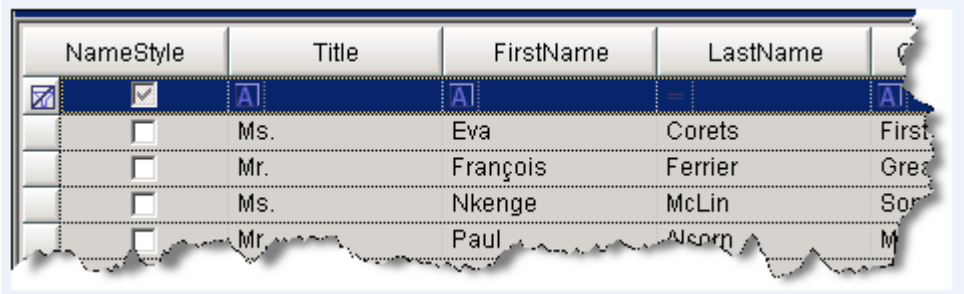



   - If you select the **(Custom)** item from the list, you can further refine your search in the **Custom** dialog box. This example shows a search for two different area codes.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




8. To perform a different search, clear your search criteria by clicking the cancel icon at the left of the filtering row.




## Discarding Changes

If you need to discard the changes made to grid values, click **Retrieve**. This action reloads the table values from the database and discards any changes. You can also initiate the action by using a script that sets the **CmdRetrieve** property to **True**.

## Viewing Errors

You can manually display or close the **Status** panel in the lower part of the grid display area. The status panel can also automatically appear when an error occurs. However, after the panel appears, it remains on view.

If a command object is successful, the message "Success" appears in the Status panel. If the panel is closed, "Success" messages do not appear for successful command objects.

To close the panel, click the double-arrow icon at the right of the panel. To open the panel on demand, right-click and select **Show Status**.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

```
Cannot open database "AdventureWorksLT2" requested by the login. The login failed.
Login failed for user 'MAGELLANDEV2000\wwuser'.
No records returned.
```

**Note:** The error panel display does not change the overall area occupied by the grid graphic.

## Writing Changes to the Database

You can write changes to the database if the following conditions are met:

- The database query (or table) can be updated.
- The **ConfiguredReadOnly** custom property value is **False**.
- SQL Server security allows the security mode configured at the grid to perform an update.
- Changes made in the grid are consistent with the database schema.

Changes made in the grid are written to the database using the Write command. Changes are handled as a single database transaction. If any change fails, the entire set of changes is rolled back.

If you have sufficient privileges, you can change a value and click **Write**. You can also use a script to set the **CmdWrite** property. This action causes the grid contents to be evaluated for changes and for the changes to be written to the database.

**Tip:** After you modify cells in the grid and write them back to the database, you should also verify that the data is correctly written. In certain cases, such as a database table with an automatically incrementing primary key or interdependent cells, the grid does not show the true contents of the database table after you write back to it. Also, no error message is shown. It is recommended that you execute a retrieve or auto refresh command after writing to the database to make sure it is showing the current data.

### Views and Updates

Some views cannot be updated for the following reasons:

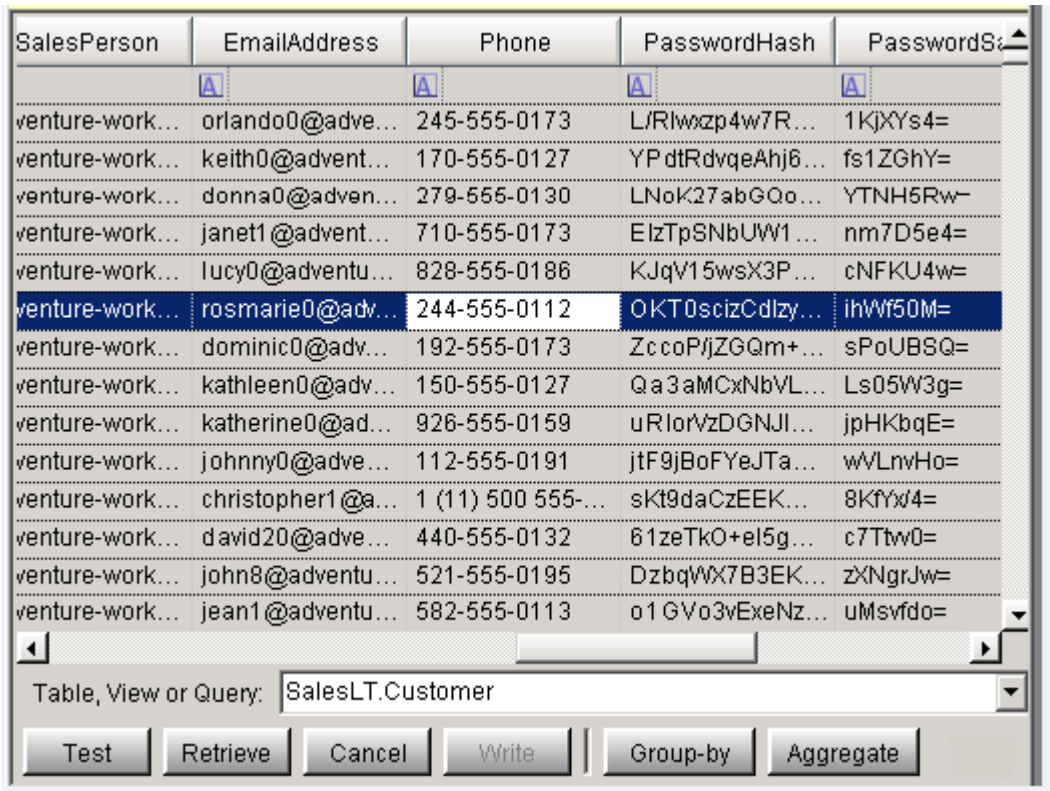
- The views contain table joins on keys other than primary keys.
- The views include security settings that prohibit updates.

If the write process fails, you can view the status in the **Error** panel. You can also monitor the **StatusDesc**, and **StatusError** properties by using text fields on the InTouch window for run-time display.

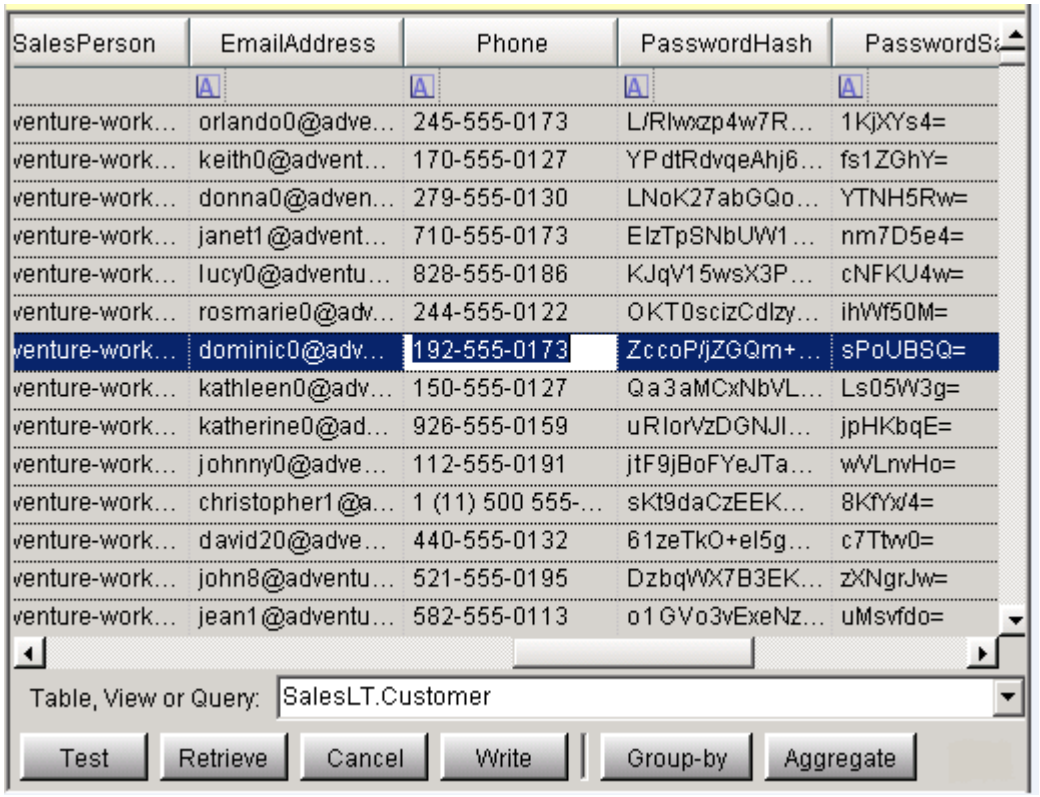
### To make a change to data in the data grid

1. Ensure that the **ConfiguredReadOnly** custom property value is **False**.
2. Click **Runtime**.
3. Enter a SQL statement or the name of a database table or view.
4. Click **Retrieve**. This example shows data from the customer table in AdventureWorks. You will modify a phone number.
5. Select the phone number that you must modify. The area becomes editable.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




6. Change the last four digits of the phone number to 0122.
7. Click an area outside the edit area. The **Write** button becomes enabled.




© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

8. Click **Write**.
9. To verify the change, click **Retrieve**.

## Database Connection Management

An important feature of the SQLDataGrid is the ability to optimize the management of multiple simultaneous connections to the database. This section describes how the infrastructure handles the database connection pool and sharing for the SQLDataGrid.

### Connection Sharing and Pooling

Multiple instances of the SQLDataGrid configured with identical connection strings use a shared connection pool and SQL command queue when they are active in the same instances of the InTouch WindowViewer. To limit the size of the shared pool, you can use the connection pool property **MaxConnections**. For configuration options, see Custom Properties for the SQLDataGrid Graphic.

Physical connections to the SQL database are opened based on command requests and are closed when no requests are pending. All SQL commands are queued and processed based on availability of connections and processing time.

The SQLDataGrid asynchronously processes all SQL commands. Asynchronous command processing ensures availability of interaction with the InTouch WindowViewer during time-consuming command processing.

Any database connection that is established in a script within a graphic using the SQLData Script Library also takes advantage of connection pooling. Similar connection strings from either the SQLDataGrid or the script in the same InTouchView application share a common pool.

---

**Note:** Connection sharing and connection pooling require that the same security mode and user credentials be used for all SQLDataGrid graphics within the InTouchView application that shares the connection or the pool.

---

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Custom Properties for the SQLDataGrid Graphic

The following table lists all available Custom Properties. Data types are shown in the Custom Properties panel and are not included in this table.

| Property Name | Description |
|---|---|
| **Authentication** | Designates whether database user authentication is SQL Server or Windows.<br>**Writable at Run Time**: Yes<br>**Default**: Windows |
| **AutoRefresh** | Automatically refreshes data appearing in the SQLDataGrid. When True, the query that repopulates the SQLDataGrid runs after the **AutoRefreshDuration** time elapses.<br>**Writable at Run Time**: Yes<br>**Default**: False |
| **AutoRefreshDuration** | Designates the requested time interval in seconds for AutoRefresh.<br>The actual refresh rate can be slower than the specified rate.<br>**Writable at Run Time**: Yes<br>**Default**: 60 |
| **ButtonPanelHide** | Hides grid buttons when the value is True.<br>**Writable at Run Time**: Yes<br>**Default**: False |
| **CmdCancel** | Cancels the last database query.<br>**Writable at Run Time**: Yes<br>**Default**: False |
| **CmdClear** | Clears the contents of the SQLDataGrid.<br>**Writable at Run Time**: Yes<br>**Default**: False |
| **CmdCopy** | When True, copies the current selection to the clipboard.<br>**Writable at Run Time**: Yes<br>**Default**: False |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Property Name | Description |
|---|---|
| **CmdLogDiagnostics** | Writes the current DCM diagnostic values to the logger.<br>**Writable at Run Time**: Yes<br>**Default**: False |
| **CmdPageFirst** | Moves the SQLDataGrid display to the first row.<br>**Writable at Run Time**: Yes<br>**Default**: False |
| **CmdPageLast** | Moves the SQLDataGrid display to the last row.<br>**Writable at Run Time**: Yes<br>**Default**: False |
| **CmdPageNext** | Moves the SQLDataGrid display down one page.<br>**Writable at Run Time**: Yes<br>**Default**: False |
| **CmdPagePrev** | Moves the SQLDataGrid display up one page.<br>**Writable at Run Time**: Yes<br>**Default**: False |
| **CmdPaste** | When True, pastes the current text contained on the clipboard to the grid.<br>**Writable at Run Time**: Yes<br>**Default**: False |
| **CmdRefresh** | Refreshes the current SQL query data. Any pending changes are discarded.<br>**Writable at Run Time**: Yes<br>**Default**: False |
| **CmdResetDiagnostics** | Resets the current DCM diagnostic values and clears the message and event counters.<br>**Writable at Run Time**: Yes<br>**Default**: False |
| **CmdRetrieve** | Loads the selected table, view, or query to the SQLDataGrid. Any changes to a previous dataset are discarded.<br>**Writable at Run Time**: Yes<br>**Default**: False |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Property Name | Description |
|---|---|
| **CmdTestConnection** | Tests the database connection for the specified server, database, security type; and if applicable, user name and password.<br>The result is placed in the Error panel.<br>**Writable at Run Time**: Yes<br>**Default**: False |
| **CmdWrite** | Submits changes made in the SQLDataGrid to the database.<br>**Writable at Run Time**: Yes<br>**Default**: False |
| **ColumnAggregateEnable** | Specifies whether the column aggregate feature is exposed by default.<br>**Writable at Run Time**: Yes<br>**Default**: True. |
| **ColumnFiltering** | Enables column filtering and provides a row with the progressive filtering entry field.<br>**Writable at Run Time**: Yes<br>**Default**: False |
| **ColumnGroupingEnable** | Specifies whether the column grouping feature of the SQLDataGrid is exposed by default.<br>**Writable at Run Time**: Yes<br>**Default**: False |
| **ComboBoxListReadOnly** | If False, you can make changes to the edit box above the combo list box.<br>**Writable at Run Time**: Yes<br>**Default**: False |
| **ComboBoxListString** | Enables a list of table or view names, separated by semicolons to be viewable in the **Runtime** combo box.<br>**Writable at Run Time**: Yes<br>**Default**: Blank |
| **ComboBoxPanelHide** | Hides the combo box and panel.<br>**Writable at Run Time**: Yes<br>**Default**: False |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Property Name | Description |
|---|---|
| **CommandTimeout** | The number of seconds that the SQLDataGrid waits for a pending command to run before timing out.<br>**Writable at Run Time**: Yes<br>**Default**: 30 |
| **ConfiguredDatabase** | The name of the database that connects to the SQLDataGrid.<br>**Writable at Run Time**: Yes<br>**Default**: Blank |
| **ConfiguredDomain** | The domain to use with impersonation if the authentication mode is Windows.<br>**Writable at Run Time**: Yes<br>**Default**: Blank |
| **ConfiguredPassword** | SQL Server domain if the security type is Windows.<br>**Writable at Run Time**: Yes<br>**Default**: ******** |
| **ConfiguredReadOnly** | Prevents the SQLDataGrid from making changes to the database.<br>**Writable at Run Time**: Yes<br>**Default**: True |
| **ConfiguredServer** | The name of the computer hosting the database.<br>**Writable at Run Time**: Yes<br>**Default**: Blank |
| **ConfiguredUser** | The SQL Server user name if security type is SQL. This property is optional when security type is Windows.<br>**Writable at Run Time**: Yes<br>**Default**: Blank |
| **ConnectionTimeout** | The number of seconds that the SQLDataGrid tries to connect to a database before timing out.<br>**Writable at Run Time**: Yes<br>**Default**: 15 |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Property Name | Description |
|---|---|
| **ContextMenuEnable** | When True and you right-click the grid, the context menu appears.<br>When False and you right-click the grid, the context menu does not appear.<br>**Writable at Run Time**: Yes<br>**Default**: True |
| **ErrorPanelDisable** | Disables the error message display.<br>**Writable at Run Time**: Yes<br>**Default**: False |
| **ErrorPanelShow** | When True, the error panel is visible.<br>When False, the error panel is hidden.<br>**Writable at Run Time**: Yes<br>**Default**: False |
| **FeatureButtonsHide** | Hides the **Aggregate** and **Group-by** buttons.<br>**Writable at Run Time**: Yes<br>**Default**: False |
| **FontBold** | Specifies whether to display the SQLDataGrid font in bold text.<br>**Writable at Run Time**: Yes<br>**Default**: False |
| **FontName** | Specifies the name of the font.<br>**Writable at Run Time**: Yes<br>**Default**: Arial |
| **FontSize** | Specifies the point size of the font.<br>**Writable at Run Time**: Yes<br>**Default**: 9.0 |
| **InstanceName** | A name that you choose to identify a specific SQLDataGrid instance. The name appears in the **ConnectionName** diagnostic.<br>**Writable at Run Time**: Yes<br>**Default**: Blank |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Property Name | Description |
|---|---|
| **MaxConnections** | The number of active connections allowed in the connection pool for a given connection string.<br>**Writable at Run Time**: Yes<br>**Default**: 100 |
| **RowCount** | The row count returned in the last successful data request.<br>**Writable at Run Time**: No<br>**Default**: 0 |
| **RowLimit** | Modifies the query to return a specified number of records.<br>To prevent the database query from being modified, set the **SQLQueryPassThrough** custom property to True.<br>**Writable at Run Time**: Yes<br>**Default**: 20,000 |
| **RowsChanged** | If True, one or more rows have been changed in the grid (added, odified, or deleted).<br>If False, no rows were changed in the grid.<br>**Writable at Run Time**: No<br>**Default**: False |
| **SelectedRowNumber** | The number of the selected grid row.<br>**Writable at Run Time**: Yes<br>**Default**: 0 |
| **SQLQuery** | Specifies the SQL query, table, or view data to be retrieved to the SQLDataGrid.<br>If **SQLQueryPassThrough** is True, you must add the SELECT statement along with the table or view name. For example, SELEC*T * FROM person.contact*, rather than *person.contact*.<br>**Writable at Run Time**: Yes<br>**Default**: Blank |
| **SQLQueryCurrent** | Specifies the SQL command that was run to show the current data in the SQLDataGrid.<br>**Writable at Run Time**: No<br>**Default**: Blank |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Property Name | Description |
|---|---|
| **SQLQueryPassThrough** | If True, enables the SQL statement specified in the **SQLQuery** custom property to be passed directly to the database without modification.<br><br>When this property is True and the **SQLQuery** custom property is set only to a table name or view, the grid does not insert "SELECT * FROM" in front of the table or view name.<br><br>Additionally, if this property is True, the top "n" is not inserted into a SELECT statement (where "n" is the value of the RowLimit custom property).<br><br>**Writable at Run Time**: Yes<br><br>**Default**: False |
| **SQLQueryPending** | Indicates a pending query.<br><br>**Writable at Run Time**: No<br><br>**Default**: False |
| **StatusDesc** | Specifies the error description from the last query. If no error exists, the string is empty.<br><br>**Writable at Run Time**: No<br><br>**Default**: Blank |
| **StatusError** | Specifies the error number from the last request.<br><br>**Writable at Run Time**: No<br><br>**Default**: 0 |
| **StatusIsError** | Indicates whether an error occurred in the last query.<br><br>True = Error<br>False = no error<br><br>**Writable at Run Time**: No<br><br>**Default**: False |
| **SupportThemes** | Specifies the SQLDataGrid window is formatted with Windows XP or Vista visual themes. You should always set the value of this custom property to True. This custom property is not yet supported.<br><br>**Writable at Run Time**: No<br><br>**Default**: True |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Property Name | Description |
|---|---|
| **SuppressAuthenticationWarning** | If user specifies any values in the ConfiguredUser and ConfiguredPassword properties, then a warning textbox is displayed in runtime. The warning informs the user of the possible security issue of storing the database user credentials locally. If True, hides the textbox regardless of configuration.<br>**Writable at Run Time**: No<br>**Default**: True |
| **WriteButtonHide** | Hides the **Write** button used to send changes to the database.<br>**Writable at Run Time**: Yes<br>**Default**: False |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

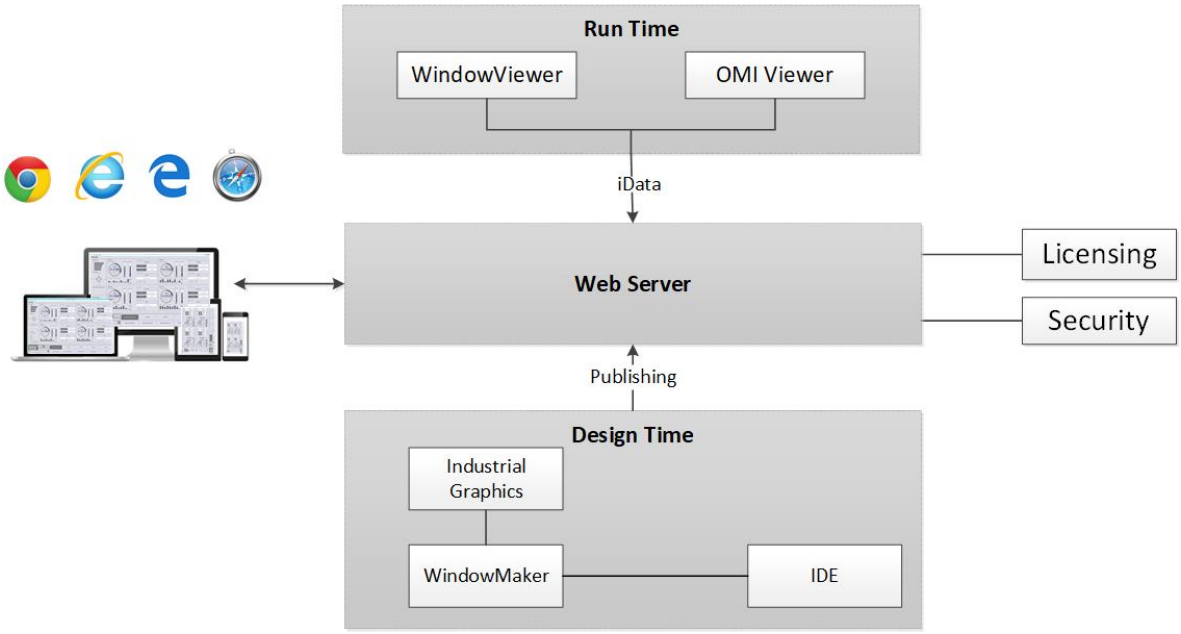
# Chapter 1 Web Client

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Chapter 1 Using the InTouch Web Client

## About the InTouch Web Client

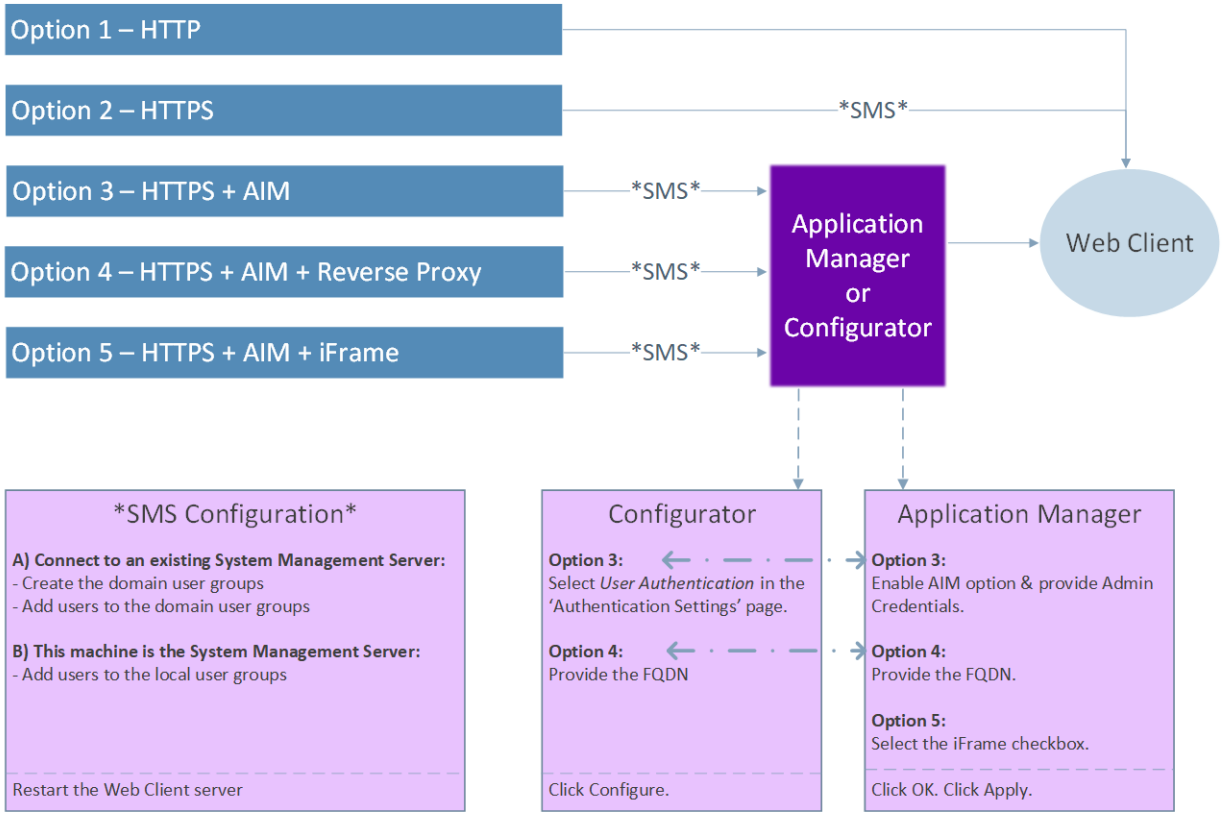
InTouch Web Client allows you to view AVEVA InTouch HMI applications on any HTML5 supported web browser. InTouch Web Client is also available on mobile platforms. A built-in Web Server provides web browsers access to applications, from any Microsoft Windows client or server operating system without the use of Remote Desktop Protocol (RDP) or Internet Information Services (IIS) for Microsoft Windows® Server.




## Securing InTouch Web Client Access

Configuring the System Management Server (SMS) allows InTouch Web Client to be used securely with the https protocol. Additionally, after configuring the SMS, InTouch Web Client can be used with the AVEVA Identity Manager (AIM), to support non-windows based security and single sign on. As an administrator there are multiple configuration options available for user authentication and security. Security and user management should work together, see Configuring User Access in InTouch Web Client for more information.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




**Option 1**: By default, InTouch Web Client can be accessed using the http protocol and windows-based authentication.

**Option 2**: Use the Configurator to connect to a local or remote System Management Server. Here the InTouch Web Client will use the https protocol with windows-based security (by default). If you connect to a remote server, you must provide credentials for a domain user when accessing the Web Client.

**Option 3**: After you configure the System Management Server, you can optionally enable the AVEVA Identity Manager (AIM). AIM is a standalone authentication server that exposes an OpenID Connect endpoint. To use AIM, you must register the client to the identity server. You can configure AIM using the System Management Server Configurator or InTouch HMI Application Manager. For more information, see Registering with the AVEVA Identity Manager.

In runtime when the InTouch Web Client page loads, if there is no valid security token, then:

- Web Client will re-direct to AIM's login page.
- AIM will check user credential from the Active Directory.
- If the credentials are valid, then Active Directory will provide a security token and return it to Web Client.
- Web Client will then grant access to user with the token.

If a security token already exists, then the user will be granted access. AIM will only support users that can be validated from Active Directory.

**Option 4**: The Reverse Proxy option allows the InTouch Web Client to be accessed by users outside the OT network. Provide the FQDN of the reverse proxy server in the secure gateway field in the Configurator or the Web Client tab in InTouch HMI Application Manager.

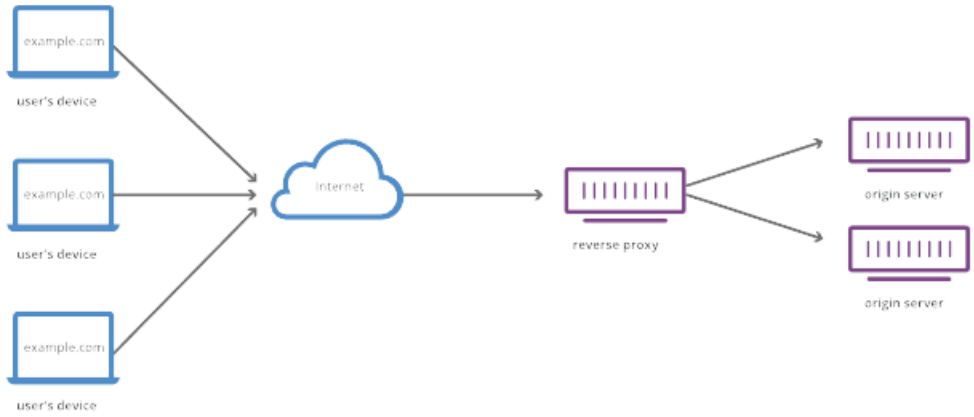
© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

**Option 5**: When AIM is used for user authentication, it will prevent graphics from being displayed in an iFrame. Selecting the **Allow web client to be embedded in any website** checkbox will allow users to display graphics within an iFrame in runtime. In runtime, use the Share icon and select the code snippet to insert in the iFrame.

## Accessing InTouch Web Client from Outside the OT Network

A reverse proxy is a server that positioned in front of one or more web servers, intercepting requests from clients. With a reverse proxy, when clients send requests to the origin server of a website, those requests are intercepted at the network edge by the reverse proxy server. The reverse proxy server will then send requests to and receive responses from the origin server. If any of these web servers are down or in case of the fail-over of one of these web servers, then the reverse proxy will send the requests from clients to the redundant web server.

A forward proxy positioned in front of a client and ensures that no origin server ever communicates directly with that specific client. On the other hand, a reverse proxy sits in front of an origin server and ensures that no client ever communicates directly with that origin server.




Before devices outside the OT network can access the InTouch Web Client, a reverse proxy must be configured on the DMZ server. AVEVA Identity Manager must be enabled for the reverse proxy to function. There are many providers of reverse proxy solutions. Refer to the relevant reverse proxy solution documentation,the information on redundancy support and instructions on setting up the reverse proxy solution in your infrastructure.

## Registering with the AVEVA Identity Manager

Using the AVEVA Identity Manager (AIM), you can configure the InTouch Web Client to use Single Sign On, instead of the default Windows OS-based authentication.

**Note:** InTouch Web Client supports ArchestrA-based security with AIM configuration only.

### To configure Identity Server

1. In the System Platform Configurator, configure the **Common Platform** > **System Management Server**.
2. In AVEVA Application Manager, register the AIM server with user credentials.

The AIM Registration dialog box can also be used to configure the reverse proxy server:

1. Setup the reverse proxy server.
2. In the System Platform Configurator, configure the **Common Platform > System Management Server**.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

3. Provide the Secure Gateway address in the AIM registration dialog box.

You can select a remote or local System Management Server. For more information on configuring the System Management Server, see the *System Platform Installation Guide*.

**To register with the Identity Server**

1. In Application Manager, click the **Web Client** tab.
2. Click **Tools** and then **Identity manager**.

   The **Identity server settings** screen appears.
3. Click the **Use AIM Server as the authentication server** checkbox to enable the use of the AVEVA Identity Manager.

   The **Identity Server** field displays the Identity Server configured in the Configurator.
4. Update the following settings:
   a. **User Name**: Provide the user name to connect to the Identity Server. The user must be part of the Administrators user group.
   b. **Password**: Provide the password for the corresponding user name.
5. To complete the reverse proxy setup, provide the URL of reverse proxy or DMZ server in the **Secure Gateway** field.

   This is an optional setting and only needs to be set if the Web Client is hosted behind a reverse proxy server.
6. Optionally you can also click the **Allow Industrial Graphics to be embedded in any website** check box to view the web client within an HTML iframe in runtime.
7. Click **OK**.
8. Click **Apply**.

**Note:** If the web site name or address is changed, you must configure the AVEVA Identity Manager to register the new web site.

## Accessing the InTouch Web Client Using Single Sign On

If the System Management Server option has been enabled in the Configurator, you can use Single Sign On to access the InTouch Web Client. This will be different from the default Windows based authentication. This method will use the HTTPS protocol and only support domain users (when using a remote SMS) that can be validated from Microsoft Active Directory. If the user selects to use the HTTP protocol, then Web Client will fall back to using Windows based authentication only.

For more information on configuring the System Management Server, see the *AVEVA System Platform Installation Guide.*

1. Launch Web Client.

   The login page appears.
2. Enter your username and password.
3. Click **Login**.

   Optionally, you could click on **Windows Integrated** to use the credentials of the user currently logged in.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

You will be logged with the Identity Manager credentials.

4. Use **Sign Out** to logout of the session.

## Using Local Tags with AIM

The behavior of Local tags in InTouch Web Client is independent of WindowViewer. The behaviour of local tags will differ if AIM is enabled. If AIM is enabled a unique token is used for every session for every user.

| | **User 1 – Session 1** | **User 1 – Session 2** | **User 2 – Session 1** |
|---|---|---|---|
| **AIM Disabled** | Same tag value | Same tag value | Different tag value |
| **AIM Enabled** | Different tag value | Different tag value | Different tag value |

## InTouch Web Client in Operations Control connected experience

When Operations Control connected experience is enabled in the Configurator, you will be prompted to authenticate with AVEVA Identity Manager, when the InTouch Web Client is launched for the first time. You have to use your AVEVA ID and password to sign in. In the subsequent launches of Web Client, you will be authenticated with Single Sign-On (SSO). If you have already signed in the AVEVA Identity Manager while launching the other AVEVA applications like Application Manager, and WindowMaker, and if you have valid entitlements and permissions, you will be signed in using SSO. Note that SSO between desktop applications and Web Client will work only when desktop applications use the system browser to authenticate. SSO is browser specific. That is, if you had entered the credentials in one browser for example Google Chrome, and if you open the Web Client in another browser for example Microsoft Edge, or if you open Web Client in incognito mode, then you will have to enter the credentials again.

---

**Note:** If you are upgrading from System Platform 2023 to System Platform 2023 R2, and if you have already configured AVEVA Identity Manager in System Platform 2023, then post-upgrade you must reconfigure user authentication by switching to windows authentication and then to user authentication to make Web Client work in Operations Control connected experience. That is, you have to first select **Windows Authentication** under **Industrial Graphics Server** > **Authentication Settings** and click **Configure**. Then, again select **User Authentication** under **Industrial Graphics Server** > **Authentication Settings** and click **Configure**.

---

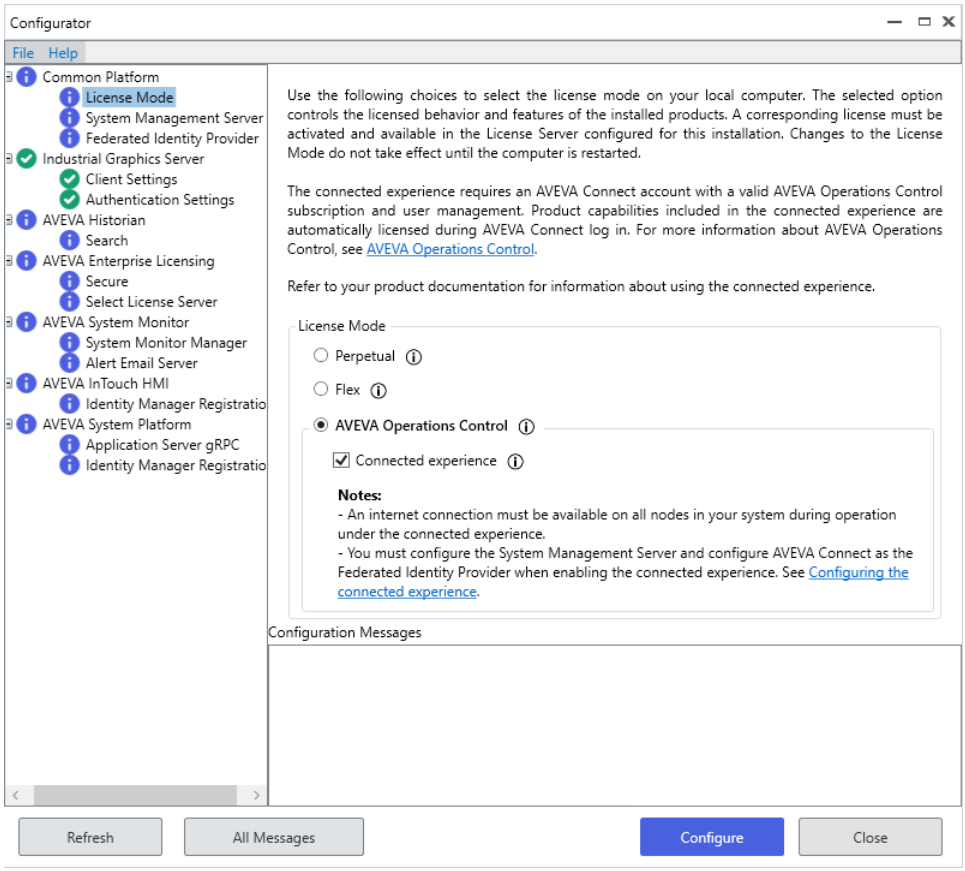
For more information refer to:

- Configurator Help
- AVEVA Identity Manager Help

**To work with InTouch Web Client (on premise) in Operations Control connected experience:**

1. Open the Configurator from **Start** > **AVEVA** > **Configurator**.
2. Select **License Mode** in the left pane to configure license mode.
   a. Select **AVEVA Operations Control** radio button to subscribe for at least one of two AVEVA Operations Control packages (Edge and Supervisory); that includes unlimited use of all products in the product package for your defined set of users.
   b. Select **connected experience** check box to enable a Single Sign-On (SSO) experience across all Operations Control products on this node with AVEVA Connect cloud capabilities, available in the products by default.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




3. To configure the System Management Server, in the left pane, under **Common Platform**, select **System Management Server**.

---

**Note:** If you are prompted for user credentials for the System Management Server, use the following format to enter the user name: DomainName\UserName. The prompt for user credentials may be displayed if you have domain admin privileges but are not an admin on the local machine. You must be a member of the Administrators or aaAdministrators OS group to configure the System Management Server.

---

   a. To connect to an already existing System Management Server, select the **Connect to an existing System Management Server**. From the list of System Management Server available, select the required System Management Server. Note that the list displays all machines on the network that have been configured to function as System Management Server. In most cases, there is only one System Management Server.

   b. To configure a machine as a Redundant SSO (RSSO) server, under **Connect to an existing System Management Server**, select **Configure this machine as a Redundant SSO Server**.

   OR

   c. To configure the current machine as a System Management Server, select **This machine is the System Management Server** option.

   d. Click **Configure**.

---

**Note:**

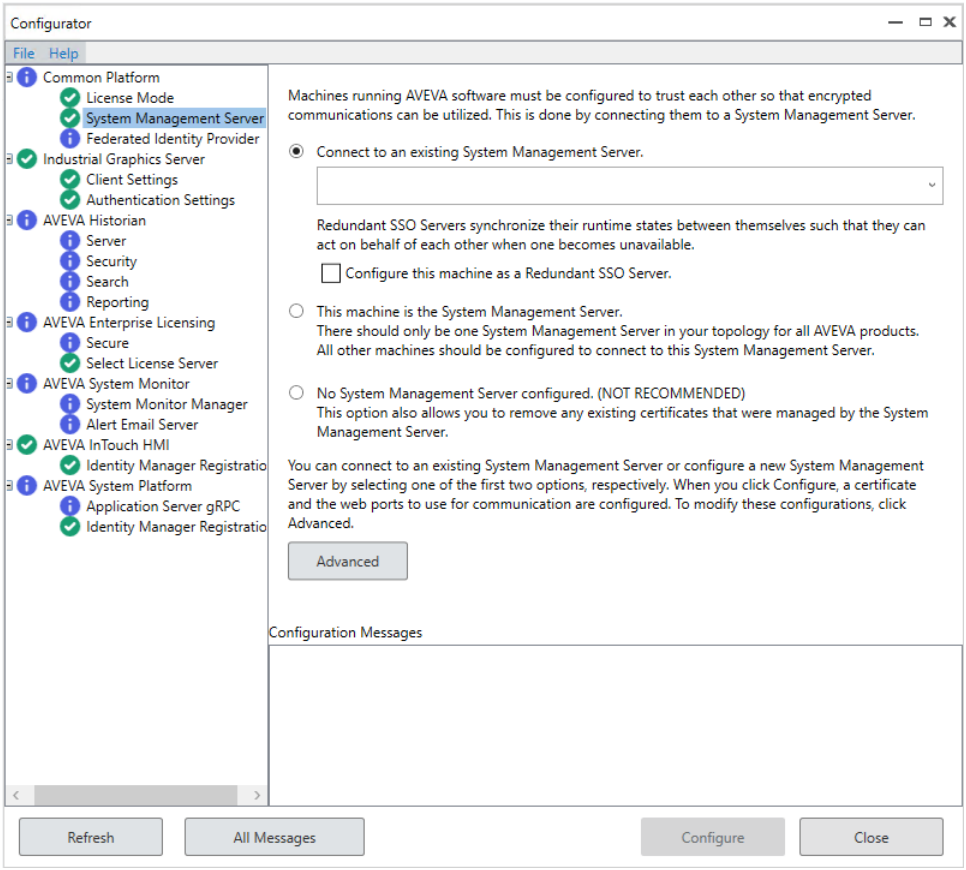
---

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- **No System Management Server configured** option is not supported for Operations Control connected experience. You must configure a System Management Server to use Operations Control connected experience.

- Only one of the machines in the network is identified and configured as a System Management Server. Machines running AVEVA products can then connect to that single System Management Server to establish trust and configure encrypted communications.

- Configuring Redundant SSO does not configure a separate System Management Server.




4. To configure Federated Identity Provider, in the left pane, under **Common Platform**, select **Federated Identity Provider**.

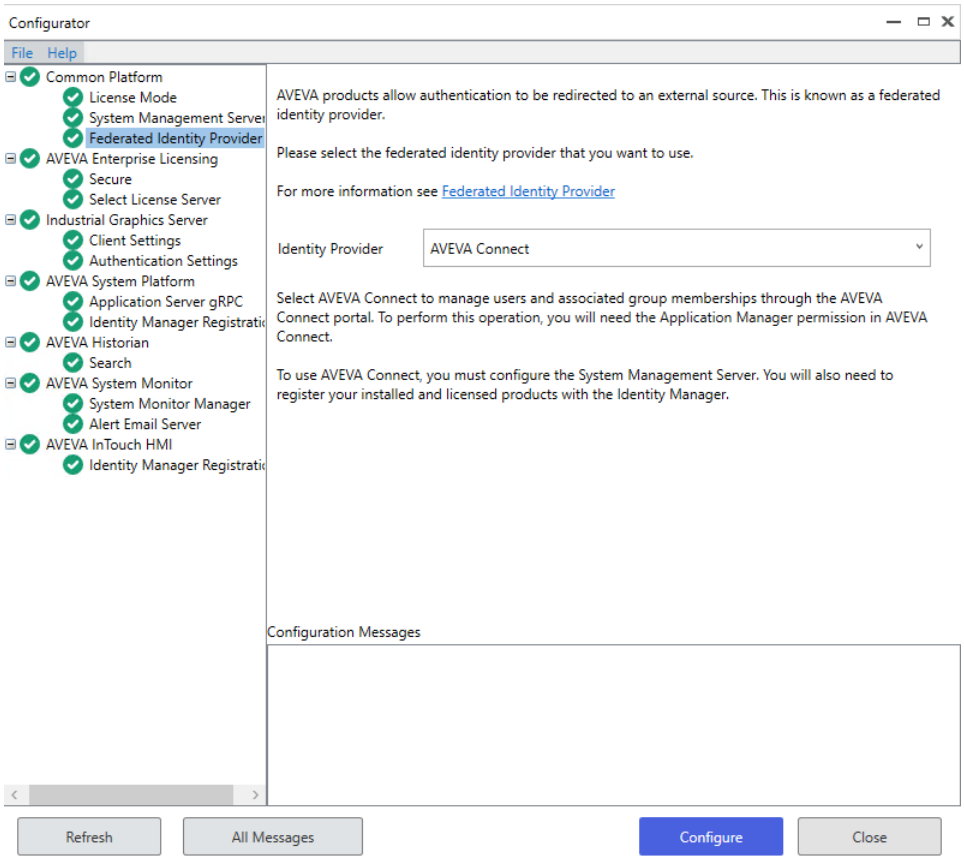
   The Identity Manager component in the Platform Common Services (PCS) Framework available on the System Management Server (SMS) and Redundant SSO (RSSO) machines can be configured for "federated" login with AVEVA Connect. This means that a user can enter their email address as registered with an AVEVA Connect account into the Identity Manager login form, at which point they are redirected to AVEVA Connect so they can log in. At present, for Operations Control connected experience, only federation to AVEVA Connect is supported and Azure AD is not supported.

**Note:**

- For a federated identity connection, you need a valid AVEVA Connect account, and you must be an administrator on that account.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

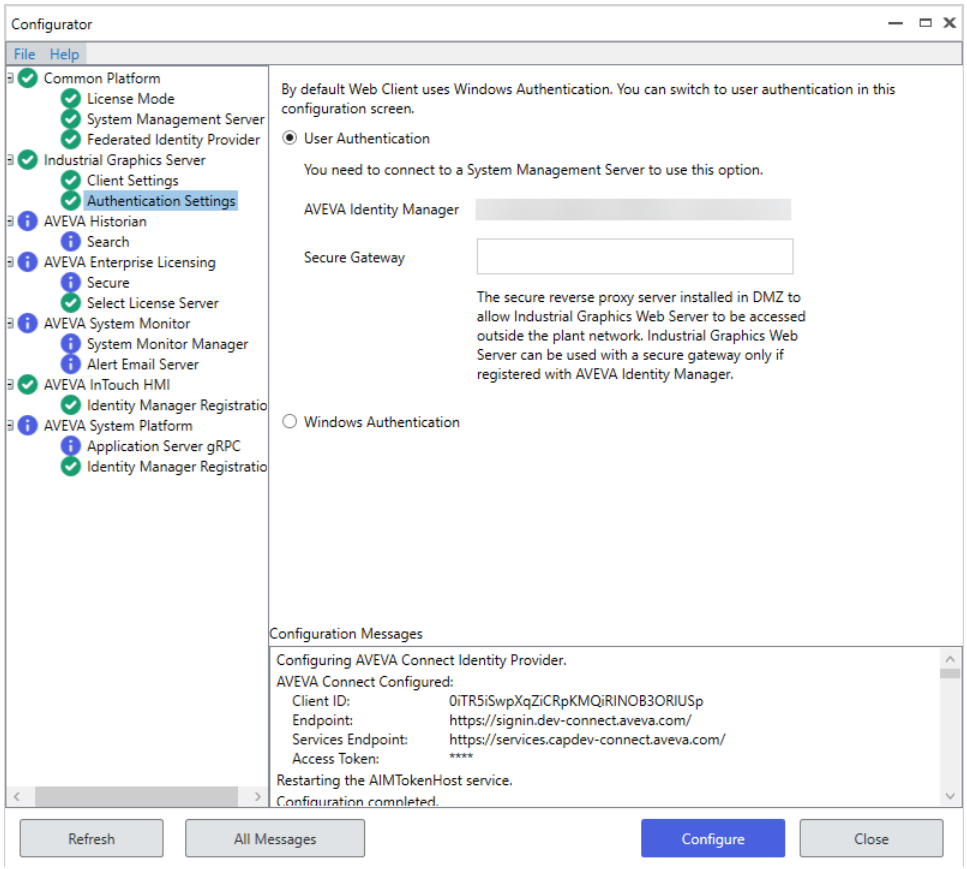
- This step only applies to the node where This machine is the System Management Server is configured. If a node is connecting to an existing System Management Server, configuring the Federated Identity Provider is not required.




If you have multiple AVEVA Connect accounts, then after the authentication, an Account selection dialog listing multiple AVEVA Connect account name that you are part of will be displayed. Select the account that you want to be federated with and from that point onwards the machine and all the Operations Control products will by authenticated or validated for subscription for that selected account.If you are part of only one AVEVA Connect account, then the account selection dialog will not be displayed.

5. To configure the InTouch Web Client to use User Authentication, in the left pane, under **Industrial Graphics Server** > **Authentication Settings**, select **User Authentication** and then click **Configure**.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.



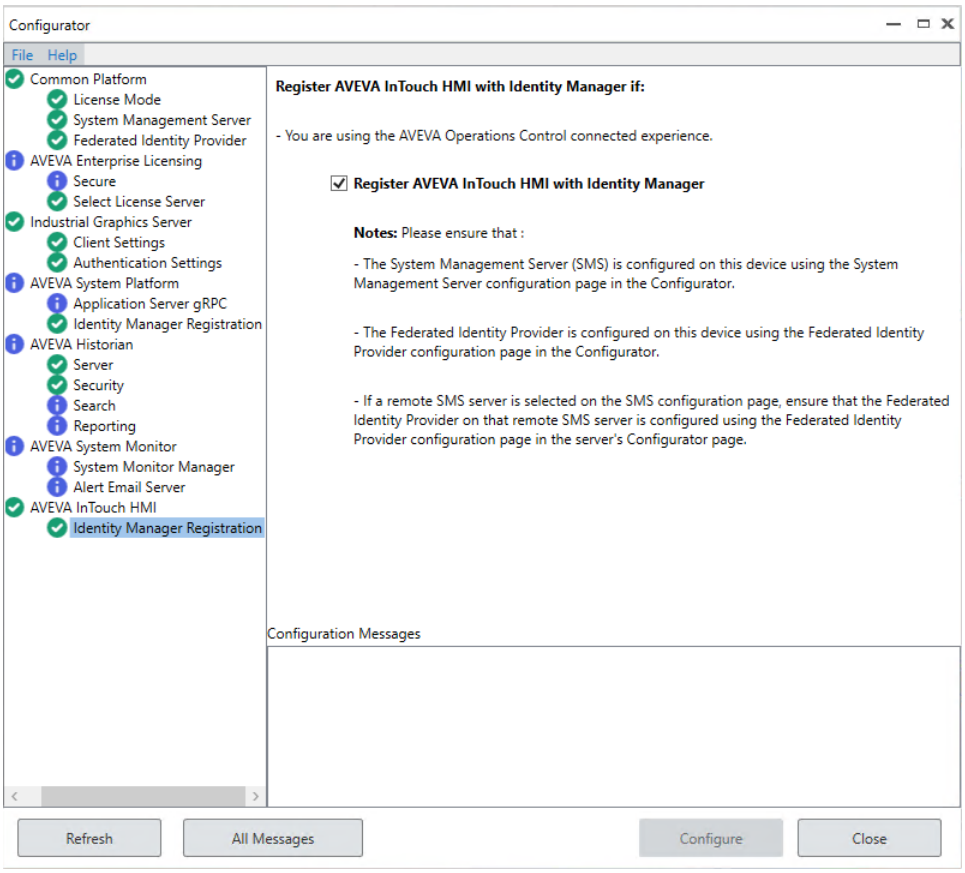

6. To register InTouch with AVEVA Identity Manager, in the left pane, under **AVEVA InTouch HMI**, select **Identity Manager Registration**.
   a. Select **Register AVEVA InTouch HMI with Identity Manager** check box.

      Register InTouch HMI with Identity Manager only when you have completed the preceding steps.

      - You have enabled AVEVA Operations Control connected experience as your license mode.
      - You have configured the System Management Server.
      - You have selected AVEVA Connect in the Federated Identity Provider.

   b. Click the **Configure** to register with Identity Manager.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

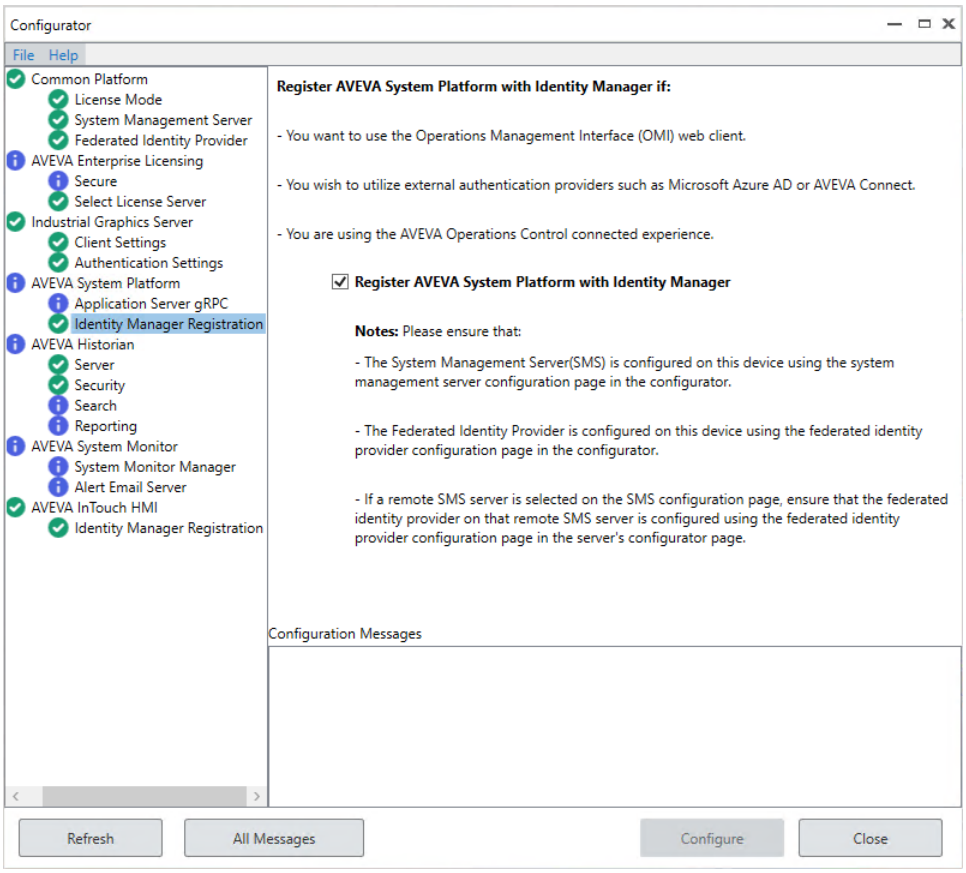



7. To register System Platform with AVEVA Identity Manager, in the left pane, under **AVEVA System Platform**, select **Identity Manager Registration**.
   a. Select **Register AVEVA System Platform with Identity Manager** check box.

      Register AVEVA System Platform with Identity Manager only after you have completed the System Management Server configuration.

   b. Click the **Configure** to register with Identity Manager.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




8. Launch Web Client.

   If you are launching Web Client for the first time on this node and no other Operations Control product was launched and authenticated on the same node before, then you are prompted to authenticate with AVEVA Identity Manager on a web browser or embedded browser (based on the choice that you have made while configuring Authentication tab in System Management Server of the Configurator). If you have already launched and authenticated Web Client on this node or launched and authenticated any other Operations Control product on the same node before, then you will be authenticated using Single Sign-On.

9. Enter your email address that is registered with an AVEVA Connect account to sign in to AVEVA Identity Manager and the respective password.

   On successful authentication and valid entitlement, the Web Client runs. You will not have to enter the credentials on subsequent logins as it signs in using Single Sign-On (SSO).

   **Note:** If the credentials are not correct then you will be prompted with an error message. Contact your administrator for the credentials and enter the correct credentials again.

### Scenarios for Invalid Entitlements

This section describes the different scenarios that could occur if the entitlement is not valid.

- If you do not have access to entitlement, WindowViewer will launch in Demo mode.

  **Note:** Demo mode will be offered, if application has 32 tags or less configured. Demo mode will not be offered if application has more than 32 tags configured.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- If current authentication is unsuccessful, but if you have successfully authenticated and logged in at least one time on that node previously, WindowViewer will launch in Read-Only mode. Read-Only mode will continue to run until that locally stored expiration date passes. When the expiration date has passed, application will run in Demo mode.
- If you launch the WindowViewer and cancel authentication, and there is a login timeout, WindowViewer will start in Demo mode or Read-Only mode.
- If you try to authenticate and only receive a valid AVEVA Identity Manager token, and is disconnected from AVEVA Connect, then on-premise functionality will work and Cloud access will fail. You need to login to regain cloud access.
- If you attempt to authenticate, and do not receive a valid AVEVA Identity Manager token, and is disconnected from AVEVA Identity Manager, WindowViewer will start in Demo mode and Read-Only mode.
- When WindowViewer is running successfully, a check is made for valid AVEVA Identity Manager and AVEVA connect refresh tokens.If only a valid AVEVA Identity Manager token is received, and AVEVA Identity Manager is disconnected from AVEVA Connect, on-premise functionality will work, but cloud access will fail.
- If disconnected from AVEVA Identity Manager, WindowViewer will start in Demo mode or Read-Only mode.

### Unsupported Functionalities

The following features are not supported by Web Client:

- Windows authentication is not supported in Operations Control connected experience.
- Share functionality is not supported in Operations Control connected experience.
- Web Client does not support redundant single sign on functionality in any licensing mode.

### Licensing and Entitlements for Web Client in Operations Control connected experience

If you switch from other licensing mode to Operations Control connected experience, you have to reconfigure the **Authentication** settings.

In Operations Control connected experience when **InTouchView Application** checkbox is enabled, to launch the Web Client you need to have entitlement to a Supervisory subscription in your account. Once you start the web server, if you modify the **InTouchView Application** checkbox then you have to restart the AVEVA Connect Industrial Graphics Web Server.

## Configuring User Access in InTouch Web Client

### Accessing the InTouch Web Client Anonymously

InTouch Web Client provides both anonymous and authenticated user access. By default, anonymous access is disabled. To enable this option, select the **Allow Anonymous Access** checkbox in the Web Client tab in InTouch HMI Application Manager. In runtime, the user does not have to provide any user credentials and will be logged in as a ‘Guest’ user. The Guest user will have read only access to Web Client.

### Configuring Authenticated Users for InTouch Web Client

Both authentication and licensing workflows use user groups to determine which users get access and the type of license acquired for the web session. The user groups can be configured on the local or remote node depending on the SMS configuration. All users needing access must be included in one of the groups depending on their access level.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

If Web Client is configured to use a remote System Management Server, create the following domain user groups: aaInTouchUsers and aaInTouchRWUsers on the remote server. Add all relevant users to these groups before deploying the application.

## Enabling the InTouch Web Client Feature

By default, on installation the InTouch Web Client feature will be disabled. You must enable the InTouch Web Client feature before you can use it. The InTouch Web Client feature will be automatically enabled if you configure one of the following options in the Configurator:

- **Common Platform** > **System Management Server**
- **Application Manager** > **Web Client**

For more information on the Configurator, refer to *System Platform Installation Guide*. To enable or disable the Web Client feature manually, you must have administrative privileges. You can enable the Web Client feature from Application Manager or InTouch WindowMaker.

### Enabling the InTouch Web Client Feature from Application Manager

1. Launch Application Manager.
2. Select the Web Client Tab.
3. On the **File** menu, in the **Main** group click **Web Client**.
4. Click **Web Client** again to disable.

### Enabling the InTouch Web Client Feature from WindowMaker

A user with administrative privileges can enable the web client feature from WindowMaker.

1. Launch an application in WindowMaker.
2. Click the **Web Client** fast switch button.

   The following dialog box appears: 'InTouch Web Client feature is currently disabled on this system. Do you want to enable it?'.
3. Click **Yes**.

   The InTouch Web client page appears.

If you try to launch the Web Client when it is disabled, you will receive the following error message: **HTTP Error 404.0 – Not Found**.

If a non-administrative user attempts to enable the Web Client feature from WindowMaker, they will be directed to enable the feature from Application Manager.

## Customizing the InTouch Web Client

The Web Client tab of the AVEVA Application Manager provides options for the user to configure InTouch Web Client related settings.

### Updating the InTouch Web Client Settings:

1. Launch the Application Manager and click the **Web Client** tab.

   The **Web Client settings** screen appears.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

2. Configure the following settings:
   - *Current application:* Select an application from the list to modify the web client settings.
   - *Graphic refresh rate (ms)*: Set the rate on how frequently the web browser will query the web server for graphic data. The default is 1 second. For more information, see the System Platform Installation Guide.
   - *Alarm refresh rate (ms)*: Set the rate on how frequently the web browser will query the web server for alarm data. The default is 1 second. For more information, see the System Platform Installation Guide.
   - *Show header*: Select the checkbox to display the Title Bar.
   - *Enable navbar*: Select the checkbox to display the Navigation Bar.

     This setting will be disabled if the **Show header** setting is not selected.
   - *Allow Anonymous Access*: Select the check box to allow users access to web client without authentication.
   - *Enable workspaces*: Select the check box to enable Workspaces.
3. Under the Advanced settings section, click **Customize** to configure the following settings:
   - *Website name*: Provide a string that will replace the standard URL.
   - *Application title*: Provide a string that will appear as a title for the application in the App Bar.
   - *Website title*: Provide a string that will appear as the title on the title bar of the browser.
   - *Website icon*: Provide an image file that will replace the icon on the title bar of the browser.
     i. Click **Choose file**... to select the icon image.
     ii. Select a file.
     iii. Click **Open**.
4. Click **Save**, to save the advanced settings.
5. On modifying the settings, click **Apply**.
6. To view the InTouch Web Client, click **Launch**.

**Note:** If the web site name or address is changed, ensure to configure the AVEVA Identity Manager to register the new web site. For more information, see Registering with the AVEVA Identity Manager.

For more information on these settings, see Viewing *Application Graphics in a Web Browser*.

## Viewing Applications in a Web Browser

After you configure the InTouch Web Client application you can view the application in the web browser. For a list of tested and supported browsers, see Browser and Mobile Support.

**Note:** For InTouch Web Client to function correctly, it is recommended to always install the latest version of browser or upgrade your browser to any latest version available.

1. Launch an HTML5 supported browser and enter the URL: `http://<hostname>/InTouch` or `http://<IPAddress>/InTouch`.

   If your credentials are authenticated and a valid Web Server license is acquired, the InTouch Web Client page is displayed. The Home Symbol will be displayed by default.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

You can access the web client using the URL: https://<hostname>/InTouch or https://<IPAddress>/InTouch. The Web Client will automatically use the HTTPS protocol, when the Common Platform System Management Server is configured with a certificate (local or remote server) for encrypted communication between the server and client. If the Web Client page is not displayed, refer to Troubleshooting Viewing Graphics in a Web Browser.

For information on customizing the Web Client URL, see Customizing the InTouch Web Client.

2. Click the hamburger icon.



The overlay on the left displays the hierarchical structure of the graphics, under the selected Web Client Root folder within the running application.

3. Click a folder name.

The graphics within the folder are displayed.

4. Click a graphic.

The selected graphic is displayed on the InTouch Web Client.

Only graphics stored within the folder set as the Web Client Root folder are displayed on the web browser. If anonymous access disabled, then the user account accessing the graphics must be Authenticated and Authorized, for more information see Acquiring a License.

**Note**: For improved graphics rendering and better overall performance, we recommend enabling GPU hardware acceleration.

InTouch WindowViewer must be running on the host machine, with a Read/Write InTouch license, for symbols in the Web Client to receive live data from InTouch tags. You can also run WindowViewer as a service. Application Server must be running to receive live data from application objects.

**Note:** A Read-Only InTouch license does not support remote data connections, and therefore does not provide sufficient functionality to act as a data source for the InTouch Web Client. All WindowViewer applications feeding data to InTouch Web Client must be running under a Read/Write InTouch license."

# Settings Related to InTouch HMI

## Designing an InTouch Web Client Application

Designing InTouch Web Client applications involves the following stages:

**Configure (Optional)**

1. Configure the security protocol.
   a. Connect to a System Management Server using the System Platform Configurator - choose between a remote or local server.
2. Configure AVEVA Identity Manager.
3. Configure the reverse proxy server.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

**Design**

1. Create and/or edit an application.
2. Identify the root folder that will contain all the graphics you want displayed on the web client.
3. Identify and set the Web Client Root folder.
4. Identify and set the Web Client Home symbol.
5. Fast switch to InTouch WindowViewer.
   - WindowViewer is required to run to access InTouch tags, but not application server object attribute references.
6. Use the Web Client fast switch button or launch a browser and navigate to http://localhost/InTouch.

**Iterative Development**

1. The home symbol is displayed on the web page.
2. Use the Navigation overlay to navigate to a symbol/window.
3. Make any graphic related changes in WindowMaker, the changes are automatically refreshed on the browser.

   Changes in Quality and Status Style, Element Style, and Formatting Styles will be propagated only after making the following graphics changes or re-launching WindowViewer.
   - Content of symbol is updated and saved
   - Symbol is created, imported, or deleted
   - Symbol is moved to different toolset folder
   - Root folder or home symbol assignment is updated
4. You can continue to build the application and test the output in the browser.

**Deploy**

1. Assign users to one of the Web Client related user groups (local or domain) or opt for anonymous access.
2. Publish or deploy the application.
3. Run the application in InTouch WindowViewer. WindowViewer must be running, to receive live data from InTouch tags.

   After the application is published or deployed, it will be available from any computer on the intranet.

   You can point to http://<IPAddress>/InTouch or http://<NodeName>/InTouch, where <IPAddress> or <NodeName> corresponds to the machine where the application is published or deployed.

## Using Virtual Account for InTouch Web Client

The Web Client virtual service account has had its privileges reduced to improve security. To continue using the Web Client for an InTouch Application, the InTouch Web Client virtual service account must have read/write access to the InTouch Application Folder. The virtual service account for the InTouch Web Service is called “NT SERVICE\AIGWebServer”.

The InTouch Web Client virtual service account will be granted read/write access to:

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- all existing InTouch applications.
- all InTouch applications created/imported via Application Manager
- all InTouch applications found via 'Find' operation; only if the users select Yes to the dialog which prompts to grant Web Client virtual account read/write access to the found application.

To manually grant the InTouch Web Client virtual account access to an InTouch application:

1. Navigate to the InTouch Application folder using File Explorer.
2. Right-click the folder and select **Properties**.
3. In the **Properties** dialog, under the **Security** tab, click **Edit**.
4. In the **Group or usernames** section, click **Add**.

   The **Select Users, Computers, Service Accounts, or Groups** dialog appears.
5. Click **Locations**.

   The **Locations** dialog appears.
6. Select the computer name and click **OK**.
7. In the **Enter the object names to select** field, enter NT SERVICE\AIGWebServer.
8. Click **OK**.
9. In the **Permissions for Authenticated Users** section, under the **Allow** column, select the check-boxes: Read & execute, List folder contents, Read, and Write.
10. Click **OK**.

**Note:** The InTouch Web Client virtual service account will not be granted access to the application folder in a shared location, that is, if the application path begins with "\\", such as the path to a file share.

## Configuring Graphics for Viewing in InTouch Web Client

Using the Graphic Toolbox, you can configure the folder containing the application graphics that will be displayed in InTouch Web Client. Only graphics stored within the folder set as the Web Client Root folder are displayed on the web browser.

**Note:** The operating system user groups **aaInTouchUsers** and **aaInTouchRWUsers** will be created on the InTouch runtime node during installation. Only users in the aaInTouchUsers or aaInTouchRWUsers user groups will have access to view graphics from an application in the web browser. Add relevant users to the group before configuring the application. By default, the installation user will be added to the groups.

1. Start InTouch WindowMaker.
2. Open an application.

   In the **Industrial Graphic Toolbox**, create or identify the folder that will contain the hierarchy of folders and graphics you want displayed on the web browser.
3. Right-click the folder and select **Set the Web Client Root Folder**.

   The icon thumbnail will change to reflect the setting.

| Icon | Description |
|---|---|

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
|  | When the root folder is set as the Web Client Root folder |
|  | When a folder other than the root folder is set as the Web Client Root folder |

By default, the root of the Graphic Toolbox is set as the Web Client Root folder.

## Setting the InTouch Web Client Home Symbol

You can set the default symbol displayed on the InTouch Web Client page when it is launched by setting the Web Client Home Symbol.

1. Set the Web Client Root Folder, see Configuring Graphics for Viewing in InTouch Web Client.

   The Home Symbol must be a child of the Web Client Root folder.

2. Under the Web Client Root folder, identify the home symbol.
3. Right-click the symbol and click **Set Web Client Home Symbol**.

The icon thumbnail (  ) will change to reflect the setting. If no home symbol is set, the Web Client web page will display a blank page when launched. While viewing the Web Client in a browser, click the Home icon on the App bar to navigate to the home symbol.

## Understanding the behavior of the InTouch Web Client Home Icon

Standalone applications can be viewed on the web client. Standalone application windows must be converted to Industrial Graphics before they can be viewed on the Web Client. Only Frame windows and Industrial Graphics can be viewed on the web client.

For InTouch applications, in WindowMaker you can use the Home Windows tab to set up windows that will appear by default in WindowViewer, see *Setting Windows to Appear at Run Time*. Similarly, you can set a graphic to be the default symbol that appears on the web client when it is launched, see Setting the InTouch Web Client Home Symbol.

If you have used the InTouch ShowHome script function, when the windows is converted to a graphic, the script is converted to the ShowHome() function and will display the corresponding graphic as a Home symbol in WindowViewer.

These settings will impact, which window or graphic appear on the InTouch Web Client by default when it is launched. For an InTouch HMI application; there are two possibilities:

1. If Home Windows are configured

   Even if the user has configured Home Symbols, on all occasions, only the Home Windows are displayed by default. Clicking the Home icon will display the Home Windows.

2. If Home Windows are not configured

   And the Home Symbol is configured, by default the home symbol will be displayed.

   If no home symbol is configured then, by default, no symbol or home windows are displayed. Clicking on the Home symbol will not display any graphic or window.

## InTouch Web Client Fast Switch

During the development of the application you can use the Web Client Fast Switch feature to toggle between WindowMaker and the InTouch Web Client.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- To use the Web Client Fast Switch feature, click the **Web Client** button in InTouch WindowMaker.

Any changes in WindowMaker will reflect automatically on the Web Client, if the same application is being edited in WindowMaker and viewed in the Web Client. For automatic refresh to work, only one application can be edited and viewed at a time. The InTouch Web page refreshes to the symbol previously displayed. If WindowViewer is run for another application, then the Web Client page will automatically switch to that application.

- You can specify the **Graphic Refresh Rate** from the **Configurator**. By default the polling rate is 1000 milliseconds.
- You can also specify the **Alarm Refresh Rate** from the **Configurator**. By default the polling rate is 1000 milliseconds.

Alarm Refresh Rate should be greater than the Graphic Refresh Rate, and the value of the Graphic Refresh Rate should be less than 180 seconds.

---

**Note:** To enable the InTouch Web Client to run in Fast Switch mode while editing a Managed InTouch application from a remote IDE, first configure the **InTouch Web** Windows service to run as a user account that is a member of the **aaConfigTools** user group, in both the GR and Remote IDE machines. For more information, refer to the Application Server User Guide.

---

For a given InTouch application, the Web Client fast switch button in WindowMaker is disabled by default. The button is automatically enabled when the application is run in WindowViewer.

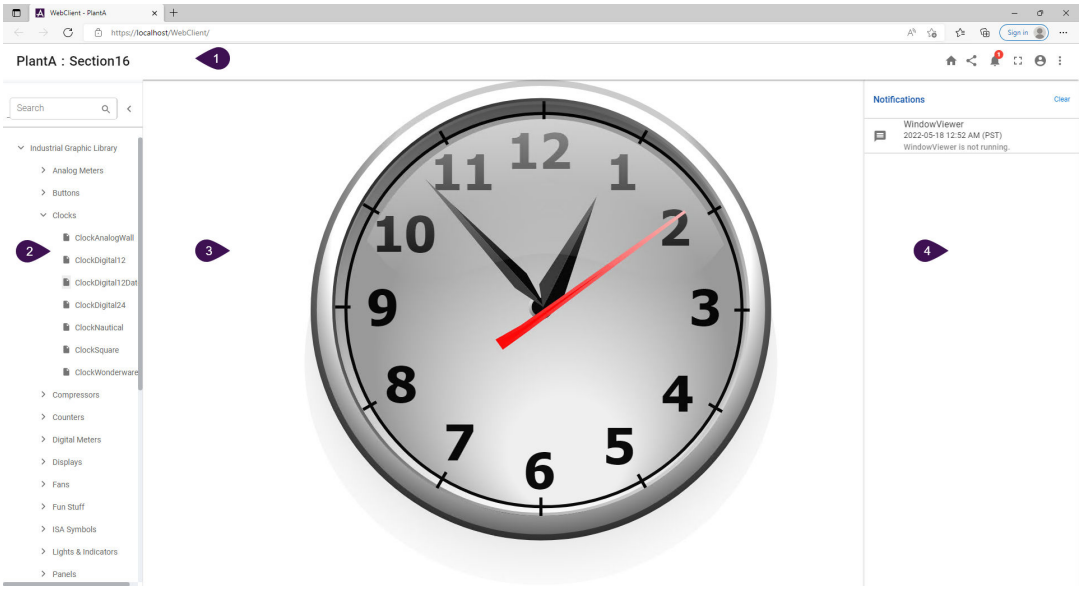
---

**Note:** The web client fast switch feature is available:
- only during development,
- only on the computer with InTouch WindowMaker and InTouch WindowViewer installed,
- only on a web browser accessing the Web Client pointing to *http://localhost/InTouch* in the URL.

---

## Understanding the InTouch Web Client Page

The InTouch Web Client page provides various options to inform and organize the user experience using icons on the page. The following table describes these options.




© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

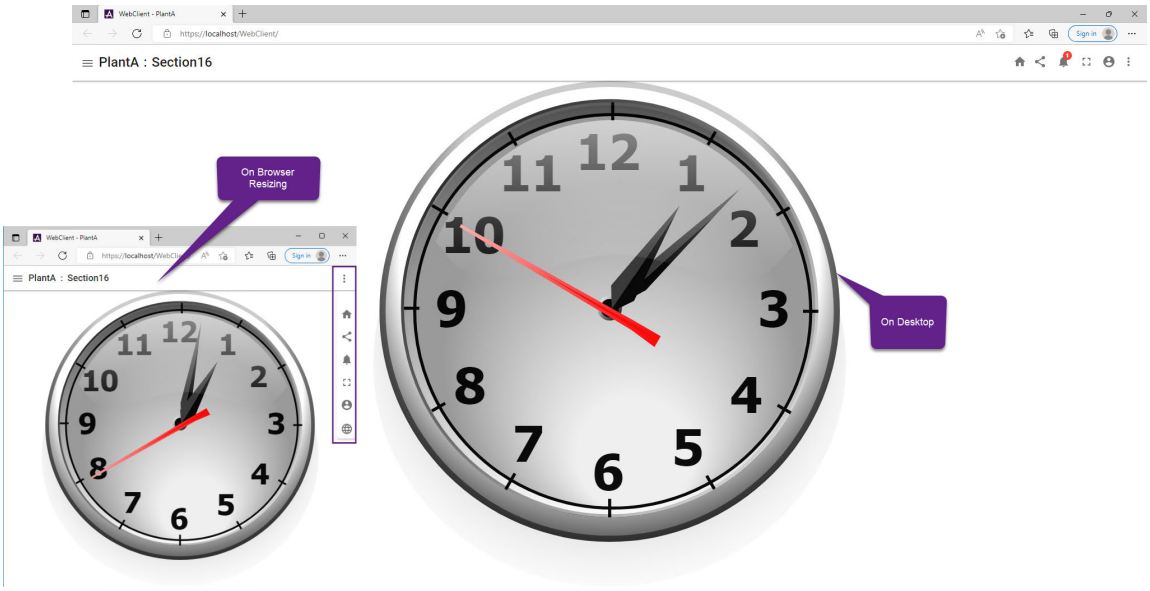
| Element | Description |
|---|---|
| 1 | The App bar displays the InTouch Application name, symbol name, home icon, notifications icon, full screen icon and profile icon. |
| Application Name: Symbol Name | The App bar will display the application and symbol name.<br>For example – *PlantA: Section16*<br>- where PlantA is the application name and Section16 is the symbol name. |
|  | Click to view the symbol set as the web client home symbol. |
|  | Click to view the iFrame code snippet for the selected graphic. |
|  | Click the Notifications icon messages related to License status change and WindowViewer status change messages. The number of notifications will be overlayed on the icon. |
|  | Click to maximize the canvas area and display the web page in full screen mode. You can also use the F11 key. The app bar and navigation overlay will not be visible.<br>**To view the title bar:**<br>• Move your cursor to the top of the page, the app bar will slide down.<br>• Click the down arrow to pin the app bar on the page.<br>• Click the up arrow to hide the app bar. |
|  | Click to minimize the canvas area and exit the full screen mode. |
|  | The profile icon displays the user logged in. |
|  | Click the profile icon and then select the **Sign Out** icon. The Sign Out will only be available if System Management Server option is configured. For more information, see Accessing the InTouch Web Client Using Single Sign On. |
|  | From the App Bar click , and then click the **Language** icon. Select the language. The tooltip, translated static text and custom properties will display in the selected language. Only languages configured in WindowMaker will appear.<br>**Note:** When the user changes the language, a new session will be created causing the data in the local tags to be lost. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | |
|---|---|
| 2 | Click the  icon to view the folder navigation overlay. All folders and symbols under the selected Web Client root folder are displayed.<br><br>You can use the search box at the top of the overlay to search for symbols. The search box is enabled with the autocomplete feature, where symbol names matching the input search term will be listed as you are typing. Select the symbol name to view the symbol in the canvas area. |
| 3 | The canvas area displays the symbol selected from the navigation overlay. The symbol will be scaled to fit the browser viewport size, while maintaining the aspect ratio. The navigation and notifications overlays do not consume any space on the canvas or affect the size of the graphic. |
| 4 | Click the notifications icon to view the notifications related to connection and licensing issues. |
|  | Click the warning icon to view the list of animations or properties not supported by the InTouch Web Client. This icon is available only during application development and when the browser points to the exact URL of http://localhost/InTouch. |

# Application Graphics and Browser Resizing

The InTouch Web Client page can be viewed in different screen sizes. As the browser is adjusted the graphics resize to fit the new browser viewport dimensions. The graphic will also resize when the mobile device is rotated between portrait and landscape orientation.



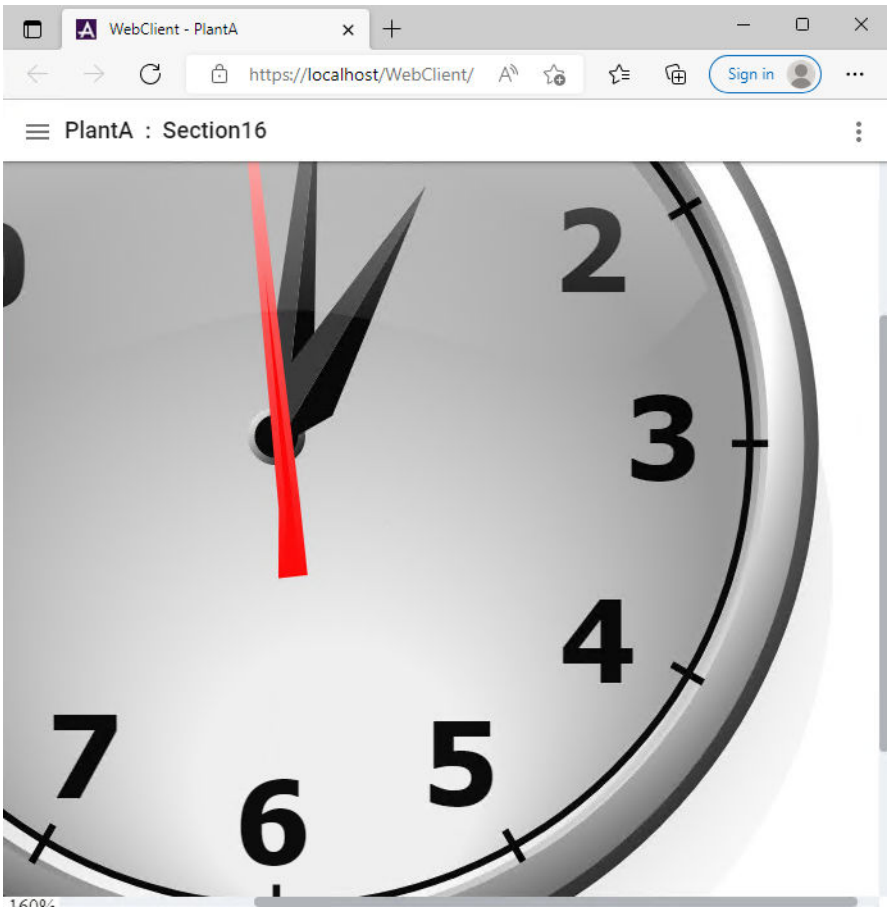

### App Bar and Smaller Screens

For very small screens, the icons on the right collapse into a vertical bar. The icons will be hidden to save screen space. You can view Industrial Graphics on any mobile device, and use the pan and zoom gestures to view larger graphics.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Pan and Zoom Support

InTouch Web Client supports the Pan and Zoom gestures for all supported browsers and devices. When a graphic in the web browser is zoomed in from a non-mobile device, the zoom percentage is displayed in the lower left corner of the horizontal scrollbar. The zoom percentage is limited up to 500%.




### Pan and Zoom using Touch

You can zoom-in and zoom-out on a focused display by using two fingers.

- To zoom-in, place two fingers on the screen and expand. To zoom-out, pinch the display with two fingers.
- Double-tap to restore the display to 100% zoom.

To pan the display, press one finger on the display and move your finger.

### Pan and Zoom using Mouse

You can zoom-in and zoom-out on a focused display by using the mouse's scroll wheel.

- Hold the **Ctrl** key and scroll the wheel up or down to zoom-in or zoom-out. If the mouse pointer is outside of a pane, then zooming will not be allowed.
- Double-click the left mouse button to restore the display to 100% zoom.

To pan a display, keep the center wheel pressed, move the mouse to the area and then release the center wheel.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### Zoom using Keyboard

You can zoom-in and zoom-out on a focused display by using keyboard.

To zoom-in, use the **Ctrl** and **+** keys together. To zoom-out, use **Ctrl** and **-** keys together.

### Zoom by Location

You can also zoom in the graphic from the location you click on.

Pan and Zoom toolbars are not supported. Pan and Zoom gestures are not supported for graphics displayed using the ShowSymbol animation or ShowGraphic script, Button, Click and Slider.

## Generating the iFrame Code Block

You can generate the <iframe> block for a symbol directly from the web browser. You can then use this code block in an external website to view Industrial Graphics in run time.

1. Navigate to the graphic.
2. Click the **Share** icon  .
3. In the **Owning Object** field, specify the Owning Object for this graphic.
4. The list of supported custom properties will be displayed. Select a custom property and provide a value.

   All values provided will be verified against the data type. For example, if a custom property requires an integer value, you will not be allowed to enter a character value.
5. Click **Support cross origin** to use the script on any Web Client, either on the local or remote machines.

   The embedded HTML code will change based on the selected options.
6. Click **Copy**.
7. You can now paste the generated code in your website in a .html file.

```
<iFrame src="http://<hostname>/InTouch/?iframe=true&symbol=Sym1?crossOrigin=1"
id="symbol" width="640px" height="480px" customProperty='[{"n":"CP1","v":"True","t":1},
{"n":"CP2","v":"24.5","t":6},{"n":"CP3","v":"Orange","t":7}]' onload="postMsg()"></
iFrame>
<script type="text/javascript">
function postMsg(){
    var iframe=document.getElementById('symbol');
    var obj={};
    for (var i=0;i<iframe.attributes.length;i++) {
        obj[iframe.attributes[i].nodeName]=iframe.attributes[i].nodeValue;
    }
    var win=iframe.contentWindow;
    win.postMessage(obj,obj['src']);
};
</script>
```

   If Language = French (France)

```
<iFrame src="http://<hostname>/InTouch/?localeid=1036&iframe=true&symbol=Sym1"
id="symbol" width="640px" height="480px" onload="postMsg()"></iFrame>
<script type="text/javascript">
function postMsg(){
    var iframe=document.getElementById('symbol');
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

```
    var obj={};
    for (var i=0;i<iframe.attributes.length;i++) {
        obj[iframe.attributes[i].nodeName]=iframe.attributes[i].nodeValue;
    }
    var win=iframe.contentWindow;
    win.postMessage(obj,'*');
};
</script>
```

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Chapter 2 Supported Graphical Elements and Known Limitations

## Known Limitations

The InTouch web client will be enhanced with each product release. The following list summarizes the major limitations in the current release.

- InTouch WindowViewer running in an RDS session is not supported for data communication with the Web Server.
- Published applications from System Platform 2017 and earlier versions are not supported by the Web Client. You must migrate the original application to the current version and then republish the application to work with Web Client.
- Frame windows with special (unsupported) characters in the window name are not supported.
- Indirect tags are not supported.
- The PlaySound() script function is not supported.
- For InTouch HMI managed applications, Galaxy based security is not supported.
- System tags will not return user name, and related details per user.
- Setting graphic properties using a script: Only the following properties are supported for reading or writing to a graphic element property using a script:
  - Position (X,Y)
  - Size(Height,Width)
  - Angle
  - StartAngle
  - SweepAngle
- Several symbols in the symbol library incorporate graphic elements or color settings that are not supported by the Web Client in the current release.
- Windows Common Controls (WCC) refer to RadioButton Group, CheckBox, Editbox, ComboBox, Calendar, DateTime Picker, and ListBox.
- The Multi Pens Trend graphic element is not supported.
- Bit State animations are not supported.
- The following Truth Table animations are not supported: Disable, Visibility, Blink, and Value Display.
- The custom properties with History Summary data type are not supported.

The following sections describe these limitations in detail.

---

**Important:** When loading a graphic in the Web Client, unsupported features are logged as warnings in the Logger. A generated report will include the warning path.

---

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

## Properties Supported by All Supported Graphical Elements

When viewed in the InTouch web client, the following properties are supported with all supported graphic elements in a symbol:

- Angle
- X
- Y
- Width
- Height
- Enable
- Visible
- AbsoluteAnchor
- RelativeAnchor
- Transparency
- ElementStyle
- OwningObject
- Start
- End
- Radius
- Tension
- Custom Property Overrides

**Note:** The ElementStyle property enables users to select a defined element style and apply it to a graphic element. An element style includes options that define color properties like FillColor, LineColor, TextColor and OutlineColor.

## Properties Supported by All Graphic Elements With Some Limitations

When viewed in the InTouch web client, the following graphic elements have some rendering limitations:

| **Graphic Element Property** | **Property Limitations** |
|---|---|
| FillColor | Texture is not supported. Some other limitations on FillColor might apply to individual elements. |
| UnFilledColor | The same limitations of the FillColor property apply to the UnFilledColor property. |
| LineColor | Texture is not supported. |
| Font | Only supports the Font Size, Font Type, and Bold or Regular Font Style options of the Font property. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Graphic Element Property | Property Limitations |
|---|---|
| TextColor | Only the Solid Color option of the TextColor property is supported. |
| FillOrientation | RelativeToScreen is supported only when Color is set as 'Solid' or 'Fill' or 'UnFill'. |
| FillBehavior | Will always be set to Both. |
| Runtime Behavior | TabOrder, TabStop, ZoomPercent are not supported on any graphical element. |
| Relative references | MyPlatform, MyEngine, MyHost, MyArea, MyContainer and Me are supported. MyViewApp is not supported. |
| AutoScale | Is not supported. |
| ShowGraphic | Is supported. |
| Line | If the Line graphic is configured with the LineWeight property value more than 1px on the rim of the symbol, it will be Truncated. |
| Group/Embed Graphic | Supports Visibility, Blink, Disable, Push Button, User Input/Value Display, ShowSymbol and ActionScript animation.<br>Changing the 'Treat as icon', and 'Enabled' properties by script is not supported.<br>%FillHorizontal and %FillVertical animations:<br>- Only applies on the group. Not supported for sub elements.<br>- for Button and Image are not supported .<br>- 'Related To Screen' for both group and sub elements are not supported.<br>- when the angle of the sub elements is changed is not supported |

## Supported Graphic Elements and Additional Properties

The graphic elements listed below are the only ones that can be displayed in the InTouch web client. **Any graphic element not listed in this table is not supported in the InTouch web client**.

The table lists the properties supported for each graphic element and any limitations of those properties. When using graphics that incorporate color properties, the colors have the same limitations applicable for FillColor, LineColor, and other related graphic properties.

**Note:** In addition to the properties listed here, all the properties listed in Properties Supported by All Supported Graphical Elements and Properties Supported by All Graphic Elements With Some Limitations can be used with any supported graphic element.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Graphic Elements | Supported Properties | Limitation Notes |
|---|---|---|
| Line<br>Polyline<br>Curve<br>2 Point Arc<br>3 Point Arc<br>Connector | Line Style<br>LineWeight<br>LinePattern<br>StartCap<br>EndCap | StartCap, EndCap: Supported but there maybe slight differences in rendering. |
| Button | ButtonStyle<br>Text<br>Word Wrap<br>FillOrientation<br>FillColor<br>Alignment | ButtonStyle: Only Standard button style is supported.<br>Word Wrap: Any caption that exceeds the button width will be truncated.<br>FillOrientation:'RelativeToScreen' is only the Color is set.<br>FillColor: Only Solid color is supported. If you have gradients with multiple colors selected, they will be converted to a single color using the first color.<br>Alignment: Only Centers alignment is supported. |
| Text | Alignment | Alignment: Only left-top supported. |
| Image | HasTransparentColor<br>TransparentColor<br>ImageStyle | FillColor, FillPercent and unfilledColor are not supported. |
| Text Box | Text<br>TextFormat<br>WordWrap<br>LineWeight<br>LinePattern<br>Alignment<br>Font | Flip is not supported. |
| Status | Graphics<br>Expression | Status Style: Only Default configuration is supported. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Graphic Elements | Supported Properties | Limitation Notes |
|---|---|---|
| Web Alarm Client (EAC)<br>(This element is supported only with some HMI/SCADA software.) | Alarm Mode<br>Colors<br>Column Details<br>Queries and Filters<br>Time Settings<br>Run-Time Behavior | **Alarm Mode**<br>• Client Mode: Only supports Current Alarms, Recent Alarms and Events.<br>• Alarm Query: Supports InTouch and application server alarms<br>• Use Default Ack Comment: Only supports comments showing Alarms and Events.<br>**Alarms and Events:**<br>Colors: Shelve, Flash Unack Alarms is not supported.<br>Column Details: Does not support sorting.<br>Queries and Filters: Only supports the 'Default' query. Customized query or filter are not supported.<br>Data Binding: Not supported.<br>Events: Not supported.<br>Time Settings: Not supported.<br>Run-Time Behavior: Only supports Show Heading, Show Grid and allow column resizing. Only supports user ACK on selected records or ACK on all alarm records. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Graphic Elements | Supported Properties | Limitation Notes |
|---|---|---|
| Web Trend Client<br>(This element is supported only with some HMI/SCADA software.) | Pens<br>Appearance<br>Options<br>Historical Sources | **Pens**<br>Only supports Show, Pen Name (As description), Expression or Reference.<br>Pen Details: Min, Max<br>Pen Options: Color Plot type(all will be treated as Line).<br>**Appearance**<br>PlotArea: Single tag mode,Grid (Show vertical grid, show horizontal grid, Color).<br>X time axis:Show cursor(Cursor1:Color), Number of values.<br>Y value axis:Number of values, Value axis label (Multiple Scales,Single Scale).<br>**Options**<br>Only supports Retrieval:Trend Duration<br>**Data Binding**: Not Supported<br>**Event**: Not Supported<br>**Historical Sources**: Connection Timeout in Seconds, Query Timeout in seconds and Use Http are not supported.<br>**Note:** Does not support the Trend Client's methods and properties. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Graphic Elements | Supported Properties | Limitation Notes |
|---|---|---|
| Web SQL Data Grid<br><br>(This element is supported only with some HMI/SCADA software.) | | Data Binding animation<br><br>Event Animation<br><br>Custom property<br><br>• CmdCopy_dg<br>• CmdPaste_dg<br>• CmdWrite_dg<br>• RowsChanged_dg<br>• WriteButtonHide_dg<br>• ColumnAggregateEnable_dg<br>• SupportThemes_dg<br><br>- SQLDataGrid control is not supported.<br><br>- The selectedRowNumber property value cannot be retrieved using custom properties.<br><br>- As databinding is not supported, the default value of a property cannot be retrieved, if the property is referenced in a custom property and the default value is empty.<br><br>- The RowCount property cannot display the grouping count due to limitations of the kendo grid. It will always display the total number of records.<br><br>- When 'Windows' authentication is used in a local database, add the virtual user NT Service\AIGWebServer to allow it to access the database. Accessing a remote database with 'Windows' authentication, and 'SQLServer' mode is not supported.<br><br>- SQLGrid is not supported when used in a carousel widget and viewed in WindowViewer.<br><br>- When groups are applied to the SQL Grid, with more than 2000 records and 5 columns, some performance issues may be seen with scrolling and refreshing of the rows. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Graphic Elements | Supported Properties | Limitation Notes |
|---|---|---|
| Trend Pen<br>(This element is supported only with some HMI/SCADA software.) | Data Source | Trend time Period: Does not support Fixed Type. |
| Check Box | | Selected Value Changes: Irrespective of user settings, only values submitted immediately are supported.<br>Checked: Does not support Checked property. |
| Radio Button Group | Static Values and Captions<br>States | Selected Value Changes: Irrespective of user settings, only values submitted immediately are supported. |
| Edit Box | | Selected Value Changes: Irrespective of user settings, only values submitted immediately are supported. |
| Combo Box | | Selected Value Changes: Irrespective of user settings, only values submitted immediately are supported.<br>Type: Does not support MaximumLength |
| Calendar | | Selected Value Changes: Irrespective of user settings, only values submitted immediately are supported.<br>Bold Dates: Is not supported<br>ShowToday: Will always display, even if checked out.<br>Calendar Colors: Is not supported |
| DateTime Picker | | Selected Value Changes: Irrespective of user settings, only values submitted immediately are supported.<br>Configuration ： Is not supported.<br>Calendar DropDown Colors: Not supported. |
| ListBox | | Selected Value Changes: Irrespective of user settings, only values submitted immediately are supported. |
| ConnectorPoint | | Moving the ConnectorPoint is not supported. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Supported Animations

The following table lists animations supported at runtime when viewing a graphic in the InTouch web client. When using animations that incorporate color properties, the selected animation colors have the same limitations as FillColor, LineColor, and other related graphic element properties. Also, viewing in a browser does not support writing values. Any type of animation that updates attribute value is not supported.

**Note:** The following table lists all supported animations. **Any animation not listed is not supported when viewing in the InTouch web client**.

| **Animation** | **Limitations** |
|---|---|
| Alarm Border | Alarm Border animation shows an alarm border around a graphic element whose visible appearance represents the graphic element's alarm type and acknowledgement status. The appearance of each alarm border is defined by an associated element style. Not all element style properties are supported. For instance, if Gradient is specified as the value of an element style's Line Color Override option in an alarm border element style, it will not be supported. |
| Element Style | Refer to the graphic elements limitations regarding color, line, and font. The same limitations applicable to graphic elements also apply to Element Style animation.<br>Expression Or Reference: Time and Elapsed Time are not supported.<br>Changes to an element style definition become effective only after redeploying or publishing the application.<br>Does not support Windows Common Controls. |
| Fill Style<br>Line Style<br>Text Style | Refer to graphic element limitations regarding color, line, and font. The same limitations applicable to graphic elements also apply to Element Style animation.<br>Expression Or Reference: Time and Elapsed Time states are not supported.<br>Does not support Windows Common Controls.<br>TextColor: Only Solid Color is supported. |
| % Fill Horizontal<br>% Fill Vertical | Only RelativeToGraphic is supported. |
| Slider Horizontal<br>Slider Vertical | A slider cannot write data to tags, but can support data binding with a custom property.<br>Slider only supports On Mouse Release when writing to a custom property.<br>Slider does not support Cursor anchor.<br>Slider does not support Show Tooltip. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| Animation | Limitations |
|---|---|
| Width<br>Height | Does not support Windows Common Controls. |
| Orientation | The Relative Anchor or RelativeOrigin are not supported when setting Orientation animation. (Only supported anchor at center). |
| Disable | The RadioButton graphic element does not support Disable animation. |
| Point | Point animation on Curve and ClosedCurve are not supported. |
| Tooltip | Tooltip animation is supported except for Image, Radio Button, Button, and Text graphic elements.<br>Tooltip animation is not supported on Group or embedded symbol.<br>Does not support Windows Common Controls. |
| Action Scripts | Action scripts are supported except for functions that invoke dialogs. The ShowGraphic animation is only supported for a Frame window. |
| Show Symbol | Title: Only supports the default option.<br>Type: Supports Modal and Modeless where the Close button option is checked.<br>Position: Only supports the center where the Client Area x,y value is 0,0.<br>Size: Only supports Relative To symbol option.<br>Shortcut: Is not supported. |
| ShowGraphic | Title: Only supports the default option.<br>Type: Support Modal and Modeless with the Close Button option checked.<br>Position: Only supports center, Client Area and x,y value is 0,0.<br>Size: Only supports the Relative To Symbol option.<br>Shortcut: Is not supported. |
| Hyperlink | Does not support on Windows Common Controls, button, text, and textbox. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Chapter 3 InTouch Web Client Mobile App

## Operating System Requirements

Download the Mobile Application from the Apple App Store or Google Play Store. Search for AVEVA Mobile Operations and click **Install**.

**Minimum Android version**: Android 6.0 (API Level 23 – Marshmallow)

**Target Android version**: Android 9.0 (API Level 28 – Pie)

**Minimum iOS version**: iOS 9.0 or later

For device support, see Browser and Mobile Support.

## Logging in to Mobile App

On installing the app, provide user credentials and login to the app to view the graphics.

1. Launch the mobile app.
2. Enter the **server name** or **IP address** of the node where the application is running.
3. Select or enter the **Website** name. The website name provided should match the *Custom URL* specified in InTouch HMI Application Manager.
4. Enter the **user name** and **password**. Provide the domain name for the user name if required.
5. Select the **Full Screen Mode** checkbox to view the app in a full screen mode.

   This setting is useful for displaying full sized graphics for TV or larger displays, where the navigation bar and header bar are hidden by default.
6. Click **Login**.

   On successful login, the Web Client Home page appears.

The user credentials are required for the first time. The application will remember the user credentials on subsequent uses. Use the **Clear** button to clear the details from the login screen. Only users that are part of the Web Client user groups can access the Mobile application. Use the log off button to exit the app.

---

**Note:** The Web Client mobile app supports anonymous login as well as login through AVEVA Identity Manager (AIM).

---

## Using the InTouch Web Client Mobile App

If your credentials are authenticated and a valid Web Server license is acquired, the application is displayed. The Home Symbol, if configured will be displayed by default.

1. Click the  icon.

   The overlay on the left displays the hierarchical structure of the graphics within the running application.
2. Click a folder name.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

The graphics within the folder are displayed.

3. Click a graphic.

   The selected graphic is displayed.

   You can also Pan and Zoom to view the graphics at a different scale.

The InTouch web client mobile app supports runtime language switching.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Chapter 4 Managing the InTouch Web Client

This section includes:

InTouch Web Client Error Handling

Browser and Mobile Support

Troubleshooting Viewing Graphics in a Web Browser

Invalid Certificate Error

## InTouch Web Client Error Handling

InTouch web client provides a uniform error page for displaying expected errors. The error page will be displayed for the following scenarios:

- **No Application** - The web client could not detect the necessary supporting files for the last application run on WindowViewer. Open the required application in WindowMaker.
- **Permission Denied** - The user currently logged in does not have adequate permission to view the web page. Add the user to the aaInTouchUsers or aaInTouchRWUsers user group.
- **No License Available** - A valid license status is not obtained for the current web session. Confirm that a valid web client license is available.
- **Fast Switch Mode** - The web client application is in fast switch mode, but the user tries to access the web client using an URL other than http://localhost/InTouch.

## Browser and Mobile Support

### Browser Support

**Note:** For InTouch Web Client to function correctly, it is recommended to always install the latest version of browser or upgrade your browser to any latest version available.

InTouch Web Client has been tested with the following web browsers:

- Google Chrome
  - Chrome on desktop version 64.0.3282.186 or later
  - Chrome on Android Phone & Pad version 64.0.3282.137 or later
- Microsoft Internet Explorer 11.0.9600.18861 or later
- Microsoft Edge
  - Microsoft Edge on Windows 10 version 41.16299.15.0 or later
  - Microsoft Edge on Surface version 41.16299.248.0 or later
- Apple Safari for iOS version 11.2.6

You will receive an error message if the web browser is not supported.

### Mobile Device Support

InTouch Web Client supports the following mobile devices and their default browsers:

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- Apple iPhone
- Apple iPad
- Android Phone & Tablet
- Microsoft Surface

## Troubleshooting Viewing Graphics in a Web Browser

If the InTouch Web Client is not displayed, verify the following settings:

- Ensure that the *InTouch Web Service* is running on the node.
- Ensure the user account accessing the InTouch Web page is part of one of the user groups.
- If IIS is running on the same machine, it may conflict with the InTouch Web Server.
  - If IIS is running and it is not being used, stop and disable the service. If IIS must run, configure to use a port other than Port 80 to avoid conflict.

If you get a *HTTP Error 404.0 - Not Found* error when you attempt to launch the InTouch Web Client:

- Ensure that Web Client is enabled on the selected node. Contact your administrator.

If any graphic primitives or animations are not visible or working as expected:

- Check the list of unsupported features to see if it is not yet supported by the Web Client.
- Run the Web Client locally via http://localhost/InTouch, browse to the symbol, and look for the compatibility icon to view a list of the unsupported items in the graphic.
- If you use a primitive or animation in a graphic that is not supported, it will be removed and a message recorded in the Logger. The logged message contains the path to a generated CSV report file. You can view the Logger message, and navigate to the report for more information.

If the selected graphic is displayed but no data is shown or animations are not updated:

- Ensure InTouch WindowViewer is running, if the graphics point to InTouch tags.
- Ensure Application Server is running, if the graphics point to Application Object references.
- Ensure the InTouch iData service is running.

## Invalid Certificate Error

**Error**: Certificate Error: Your connection to this site is not secure.

When accessing the InTouch Web Client, the browser presents this error when a valid certificate is not available on the client.

**Solution**:

1. Connect to the Server machine and launch the System Platform **Configurator**.
2. From the System Management Server page, click **Details**.

   The **Certificate** Dialog Box appears.
3. On the **Details** tab, click **Copy to File**.
4. Follow the instructions of the **Certificate Export Wizard** and save the file.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

5. Copy the certificate file to the client machine.
6. In the client machine, launch **Microsoft Management Console** (mmc).
7. Import the certificate.
8. After importing the certificate, launch the browser.

## Add an Extension to the Chrome Web Browser

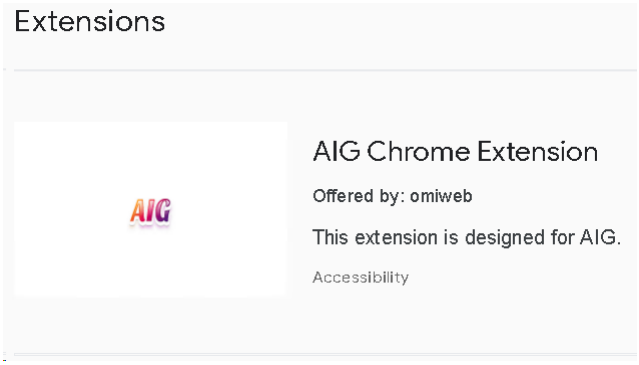
When using a Web Browser widget in the InTouch Web Client, the external content may not show in the browser's iframe because of X-Frame-Options or content security policy restrictions. The AIG extension provides a pop up window on top of the iframe that shows external content if it cannot be displayed directly in the iframe.

**To add the AIG Extension to the Chrome web browser**

1. Open the Chrome web browser on the computer that you will use to display web-enabled ViewApps.
2. Display the Google Chrome store in your web browser.

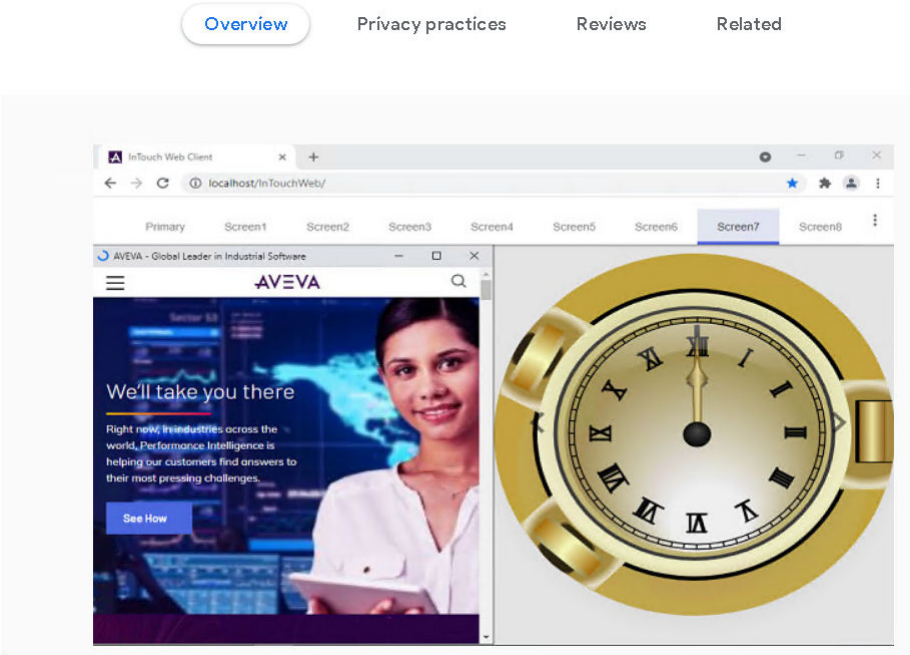
   https://chrome.google.com/webstore/category/extensions
3. Enter the phrase "aig chrome" in the **Search the store** field.

   The page refreshes to show the AIG Chrome Extension in the **Extensions** area.




4. Click on the **AIG Chrome Extension** button to show the detail page of the extension.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




5. Click the **Add to Chrome** button to download the extension and install it.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Licensing the InTouch Web Client

You need a valid Web Server license to login and view application graphics from a web browser. Licensing also extends to hosting application graphics on external websites. For detailed information on licensing, see the *AVEVA Enterprise Licensing Help*. The Web Server provides different types of licenses which allow you to connect to unlimited sessions for viewing and interacting with application graphics in a web browser, including:

- InTouch Web Server *Flex license*
- InTouch Web Server *Connection ReadWrite license*
- InTouch Web Server *Unlimited ReadWrite license*
- InTouch Web Server *Unlimited Read-Only license*

**License Status Change**

If the Web Server has acquired a valid license but then failed to renew the license, the Web Client will be in Grace Period mode. A notification message will be displayed in the notification page. The message will be logged every time Web Client attempts and fails to renew the license.

For an InTouch HMI application, WindowViewer must run with Read/Write license in order for the Web Client to connect to WindowViewer and receive InTouch tag data.

## Licensing for InTouch Application Graphics in a Web Browser

You need a valid Web Server license to login and view application graphics using InTouch Web Client. Licensing also extends to hosting application graphics on external websites. For detailed information on licensing, see the *AVEVA Enterprise Licensing Help*. The Web Server provides different types of licenses which allow you to connect to unlimited sessions for viewing and interacting with application graphics in a web browser, including:

- InTouch Web Server *Enterprise license*
- InTouch Web Server *Flex license*
- InTouch Web Server *Connection ReadWrite license*
- InTouch Web Server *Unlimited ReadWrite license*
- InTouch Web Server *Unlimited Read-Only license*

**License Status Change**

If the Web Server has acquired a valid license but then failed to renew the license, the Web Client will be in Grace Period mode. A notification message will be displayed in the notification page. The message will be logged every time Web Client attempts and fails to renew the license.

For an InTouch HMI application, WindowViewer must run with Read/Write license in order for the Web Client to connect to WindowViewer and receive InTouch tag data.

## Acquiring a License

Acquiring the license is a two-stage process. After the Web Server starts up, it will first Authenticate the user and then determine the user’s Authorization. If anonymous access has been enabled then the authentication step is bypassed and InTouch Web Client is launched in a Read-Only mode with the 'Guest' user.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

**Authentication:**

1. InTouch Web Client supports Windows authentication. The web server will validate if the user is part of either the "aaInTouchUsers" or the "aaInTouchRWUsers" to be authenticated to use the Web Client. Both the user groups will be created during installation. For a remote authentication server, the domain user groups must be created on the server.
2. The login user at the time of Web Client installation will be automatically added to both user groups. Additional users can be added later. After adding the new user to the group, the new user must log off and then re-login for the change to take effective.

**Acquisition:**

Upon start-up and after the user is authenticated, the Web Server follows the workflow below to acquire licenses.

1. The Web Server will check if the Flex option is enabled in the Configurator.

   If the Flex option is not enabled, the Web Server will attempt to acquire the Unlimited ReadWrite license. (Go to Step 4)
2. If the Flex and Enterprise options in Configurator are enabled, the Web Server will attempt to acquire the Enterprise license.

   If the Flex option is enabled and the Enterprise option is not enabled in the Configurator, the Web Server will attempt to acquire the Flex license. (Go to Step 3)
3. The Unlicensed Web Server will then attempt to acquire the Flex license.

   If the Flex license is available, the Web Server will acquire the Flex license

   If Flex license is not available, then the Web Server is said to be Unlicensed state. If the Web Client attempts to connect when the Web Server is Unlicensed, a License Error Page will be displayed.
4. The Unlicensed Web Server will attempt to acquire the Unlimited ReadWrite license.

   If Unlimited ReadWrite license is available, the Web Server will acquire the Unlimited ReadWrite license.

   If Unlimited ReadWrite license is not available, the Web Server will attempt to acquire the ReadWrite Connection license.
5. If ReadWrite Connection license is available, the Web Server will acquire the ReadWrite Connection license..

   If ReadWrite Connection license is not available, the Web Server will attempt to acquire the Read-Only Unlimited license
6. If the Read-Only Unlimited license is available, the Web Server will acquire the Read-Only Unlimited license.

   If the Read-Only Unlimited license is not available, the Web Server will enter the Read-Only Single Session mode.

## License Features

The InTouch Web Client supports the following license features:

- Flex license
- ReadWrite license
- Read-Only Unlimited license

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

The features of each of these modes are described below:

| License acquired | Supported Features | Conditions |
|---|---|---|
| Flex license | • ReadWrite license allows unlimited connections<br>• Personal Workspace with support for both InTouch and AppServer namespaces | See Note below. |
| ReadWrite license | • Write to external references such as AppServer attributes or InTouch tags<br>• Ack alarm and its user credential will be recorded as the operator who acked the alarm.<br>• Connection ReadWrite license allows a number of InTouch Web Client connections (for example, set of 5, 10, 15, etc.) to the Web Server. | You can access the Write and Alarm Ack capability if the following conditions are met:<br>• Web Server has acquired the Flex, or Brand Neutral R/W License, or Unlimited ReadWrite license or the Connection ReadWrite license<br>• InTouch Web Client session is within the allowed Read/Write connection<br>• User logged in to InTouch Web Client session belongs to Web Client ReadWrite group. |

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

| | | |
|---|---|---|
| Read-Only license | • The client session cannot write to external references or acknowledge alarms. | The user can access the Read-Only mode only if:<br>• Web Server has acquired the Flex, or Brand Neutral R/W or Unlimited ReadWrite license or Connection ReadWrite, but the user logged in does not belong to the InTouch Web Client aaInTouchRWUsers user group, or<br>• The Web Server has acquired the Unlimited ReadOnly license, or<br>• The Web Server does not acquire any license and this web client session is the first client session. |

**Note:** Fallback is not allowed for Flex license. The Web Server will be unlicensed if it is unable to acquire Flex license. In the unlicensed state of the Web Server, if the InTouch Web Client attempts to connect, a License Error Page will be displayed.

## Single Session Mode

If the Web Server does not acquire any license at startup, it will operate in the Single Web Session mode, which is assigned on a first come first serve basis.

- If a valid license is unavailable and the first session license has been acquired, the InTouch Web Client will notify the user that no licenses are available.
- The Web Server allows sessions a grace period if the Web Server has acquired an unlimited license, but subsequently loses the license.

Subscription to Application Server data will require a supervisory license. If you do not have a supervisory license, the subscription to application server data will cease after two hours.

## Grace Period

The Web Server will enter the grace period under the below conditions:

- If a valid license is acquired and later expires.
- If a valid license is acquired, but cannot be acquired later.

During the grace period, all InTouch Web Client features will be available for connected and new sessions. The Web Client page will display a visual notification that the Web Server is in grace period mode. The grace period is 14 days. After the grace period has ended, the Web Server will continue to function and immediately switch to a single license for one session, on a first come first serve basis. If the same license is acquired, then the Web Server will exit the Grace Period mode.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

## Periodic Renewal

After a valid license is acquired, a periodic license renewal will occur. The periodic license renewal operation will only check and ensure if the same license can be renewed. If the same license cannot be renewed, then Web Server will enter into a Grace Period mode.

The renewal frequency depends on the license type as listed below:

| **License Type** | **Renewal Frequency** |
|---|---|
| Flex license<br>Unlimited ReadWrite license<br>Unlimited Read-Only license | Every 7 minutes |
| Connection ReadWrite license | Every 24 hours |

License status will not be upgraded or downgraded during renewal. To acquire a different license, restart the Web Server and initiate the startup sequence of license acquisition.

## License Release

The Web Server will release all the licenses it has acquired, if the Web Server is shutdown, regardless of the number of client sessions and the current state of the Web Server license. The Web Server will also terminate all Web Client sessions immediately.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

# Chapter 5 Workspace

## Introduction

### About Workspace

A Workspace allows users to create a dashboard dynamically on the web, at run time in the production environment. The Workspace allows you to create a dashboard to monitor the functioning of a system or flag an issue. You can create and modify Workspace from the Web Client.

You can create a workspace and modify it using the Workspace Editor (referred to as the Workspace in this document). A workspace is tied to an application and will only display the graphics available under the Workspaces toolset of the Graphic Toolbox in the selected application.

Within the workspace layout, you can organize and align your graphics.

### Prerequisites for Workspace

The prerequisites to access Workspace are:

- **License requirements**

  You must have a Flex license for InTouch Web Client or an Enterprise license for OMI Web Client to access Workspace.

- **Enable Workspace**

  You can create Workspace for an application only if the Enable Workspaces option is selected in the Application Manager. For more information, see Enable Workspaces.

- **Configure AVEVA Historian Search**

  You must configure the Search for AVEVA Historian in the Configurator to search for Application Server Attributes and InTouch Tags.

## Managing the Workspace

### Enable Workspaces

You can create Workspaces for an application only if Workspaces are enabled in the Application Manager.

**To enable Workspaces**

1. Launch Application Manager.
2. In the **Web Client** tab, select an application from the dropdown.
3. Click **Enable Workspaces**.

   The Workspaces are enabled.

### Access Workspace

Once the Workspace is enabled in the Application Manager, you can access the Workspace from the Web Client.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

**To access Workspace**

1. Launch Web Client.
2. On the Title bar, click the **Workspace** icon to view the existing Workspaces.

   Click the arrow button for more options such as New and Manage.
3. Use the left side bar to modify the view.
   - To view the Workspaces in the List view, click the List icon in the left side bar.
   - To view and modify the Workspace, click the Tiles icon in the left side bar.

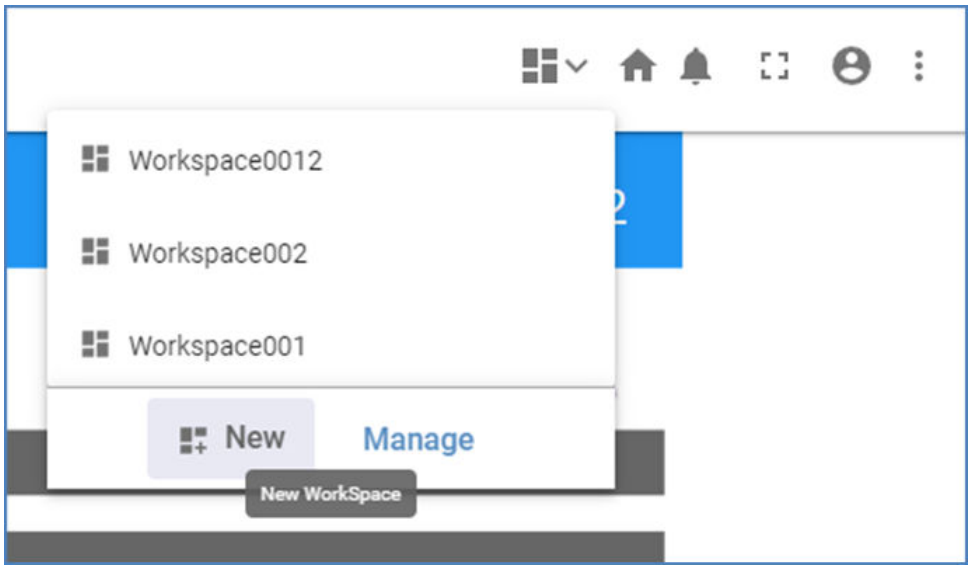
## Create New Workspace

You can create a Workspace from the Web Client.

**To create a new Workspace**

1. Launch Web Client.
2. On the Title bar, click the **Workspace** icon.

   The drop-down menu shows the list of existing workspaces with an option to create a new workspace.

   
   
3. Click **New**.

   A new workspace opens in the Workspace Editor in a new browser tab.

**To edit, delete, and copy Workspace**

1. On the Title bar of the Web Client, click the **Workspace** icon.
2. Click **Manage**.

   The **Workspace list** page appears

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

3. Select the workspace to modify.
   - To edit the workspace, click **Edit**.

     The Edit screen slides in, that allows you to edit the Workspace name and description.
   - To delete the workspace, click **Delete**.

     A message appears asking you to confirm.
   - To create a copy of the Workspace, click **Copy**.

     A new workspace is created.

## Save Workspace

You must save your Workspace regularly to ensure you don't lose any data.

**To save Workspace in Edit mode**

1. On the title bar of the Workspace screen, click **Save**.

   The **Save** dialog appears.
2. Enter the Workspace name.

   If you modify the name, the Workspace gets saved by the new name.
3. Click **Save**.

   The changes to your Workspace is saved.

## Share Workspace

You can share your Workspace with others in your team.

**To share your Workspace**

- Select your Workspace and share the URL.

**To hide the navigation pane of the Workspace**

- Append the tag "#hidenavigation" to the URL of the Workspace.

For example:

Workspace URL: https://localhost/intouch/workspace/<workspace ID>

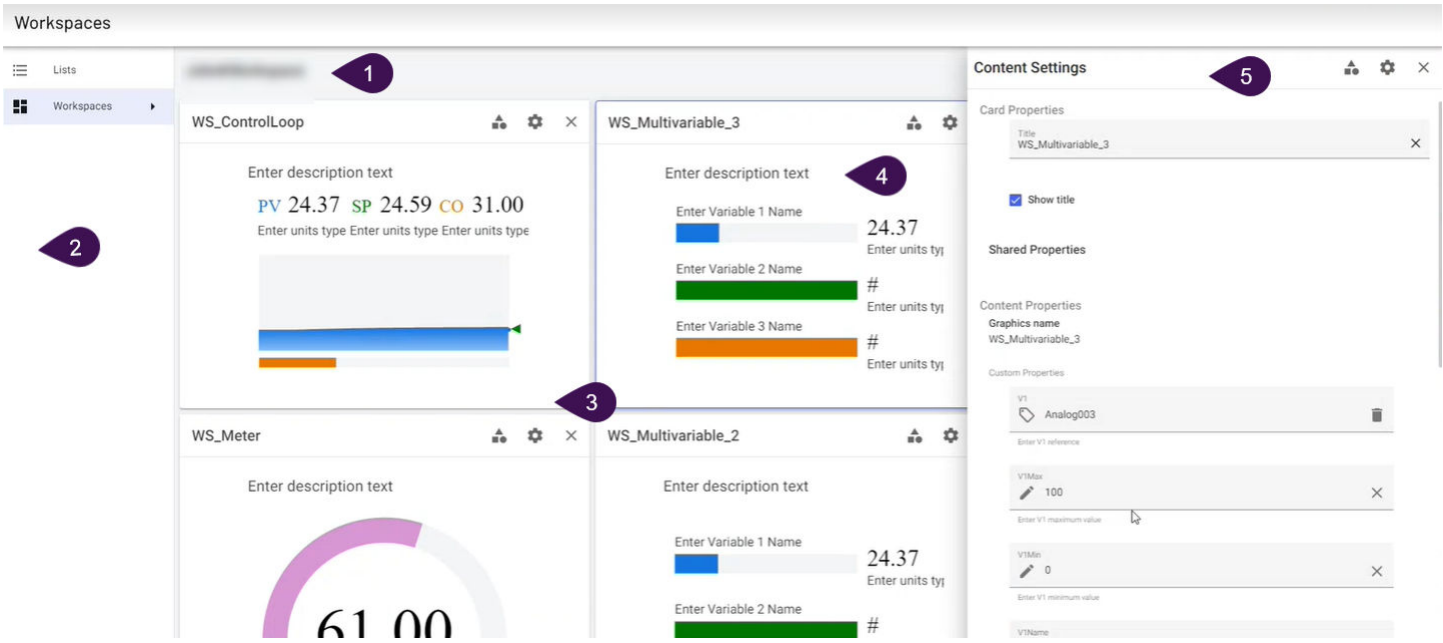
Workspace URL to hide navigation: https://localhost/intouch/workspace/<workspace ID>#hidenavigation

**Note:** Share Workspace is not supported in Web Client if the Operations Control connected experience mode is enabled in the Configurator.

# Understanding the Workspace Page

The Workspace Editor consists of various components to allow users to create dashboard, at runtime, on the web.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.




The components of a Workspace Screen are

1. Workspace Title Bar
2. Workspace View Panel
3. Working Area
4. Cards
5. Graphics Browser Panel or Content Settings Panel

## Workspace Title Bar

The Workspace Title bar is located at the top of the Workspace screen. It displays the name of the Workspace. The other options available on the title bar depends on the mode of the Workspace - View mode or Edit mode.

**Workspace Name**: Displays the name of the workspace being worked on.

### View mode

When a Workspace is opened, it opens in View mode by default. In this mode, the title bar displays the **Edit** icon.

- **Edit**: Click the Edit icon to change the workspace to the edit mode.

### Edit Mode

You can modify your workspace in edit mode.The Workspace title bar displays the following options:

- **Add**: Add a new Industrial Graphics to your Workspace.
- **Cancel**: Cancel the last changes and returns to the View mode.
- **Save**: Save the changes to the Workspace.

## Workspace View Panel

The Workspace View Panel allows you to view the list of workspaces in two views:

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- List View
- Detail view

**List view**

In the list view, the Workspaces are displayed in a list.

**Detail view**

In the Detail view, you can view the contents of the workspace. You can also edit the Workspace in this view.

The Workspace view panel contains the Manage button which allows you to manage workspace, such as, edit, copy, or delete Workspaces.

## Working Area

The working area/canvas is the main development area of the Workspace, where you can develop your dashboard. The working area follows the design of grid layout by default, that help you to organize and align the graphics effectively. To add an Industrial Graphic to the working area, select a graphic from the Graphics Browser panel. The graphic objects on the working area appear as Cards. For more information about cards, see Cards.

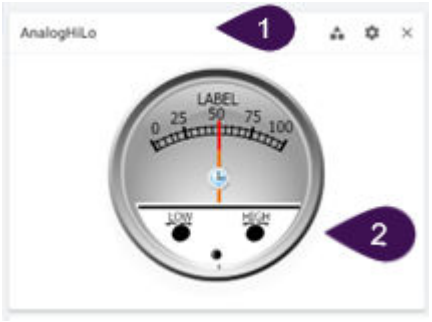
By default, the cards are placed as tiles on the working area. However, if you want to view a card in full screen, the selected card occupies the entire working area and hides the other cards. You can exit the full screen mode to view the other cards. For more information, View Cards in Full Screen Mode.

## Cards

When you drag and drop a graphic on to the working area, the graphic objects appear as cards.

Each card contains two components:

- Card title bar
- Industrial Graphics




**Card Title Bar**

The card title bar displays the card title and the options to manage the cards.

If the Workspace is in view mode, the card title bar consists of the following options:

- **Card title**: Displays the name of the card.
- **Full screen icon**: View the card in full screen. To revert to the card view while in the full screen mode, click Exit full screen.

If the Workspace is in Edit mode, the card title bar consists of the following options:

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

- **Card title**: Displays the name of the card.
- **Graphic icon**: Click Graphic to launch Graphic Browser. Select a graphic in the Graphics Browser to replace the graphic on the card.
- **Content Settings icon**: Click Content Settings to update the card and content properties. See Modify Content Settings.
- **Delete icon**: Click delete to delete the card.

### Graphics Browser

You can add Industrial Graphics to your Workspace in edit mode. You can select the Industrial Graphics from the Graphic Browser. The Graphics Browser consists of graphics from the Workspaces folder.

**To open the Graphics Browser**

- On the Title bar of the Workspace Editor, click **Add**.

  The Graphics Browser panel slides in.

For more information, see Add Industrial Graphics to Workspace.

### Content Settings Panel

The Content Settings panel displays the card and content properties, based on the current selection.

**Card Properties**

The card properties section allow you to modify the title of the selected card.

**Content Properties**

The content properties section allow you to modify the properties of the selected graphic. The fields vary based on the type of graphic selected.

- Graphic name: Displays the name of the graphic.
- Custom Properties: Allows you to either set a constant value such as number, string, boolean, or bind the custom property to a reference such as InTouch Tag or Application Server Attribute

**To open the Content Settings panel**

- On the Title bar of the Workspace Editor, click **Settings**.

  The Content Settings panel slides in.

For more information, see Add Industrial Graphics to Workspace.

## Working with Workspace

You can open an existing workspace from Web Client, and modify it using the Workspace editor.

### Add Industrial Graphics to Workspace

You can add Industrial Graphics to the Workspace to create your own dashboard. When you add an Industrial Graphic to the working area, it appears as Cards.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

### To make Industrial Graphics available in the Workspace

To use the Industrial Graphics in the Workspace, you must make sure that the Industrial Graphics are available in the Industrial Graphics Toolbox. To make the graphics available for the Workspace, do the following:

1. In the Industrial Graphics Toolbox, create a toolset named **Workspaces**.

   **Note:** We recommend you to create the Workspaces toolset at the first level of the hierarchy, that is, at the same level as the Industrial Graphics Library.

2. Drag-and-drop the graphics that you want to use in your Workspace into the Workspaces toolset.

   The Industrial Graphics saved in this toolset will be displayed and available to be used in the Workspace.

### To add Industrial Graphics to the Workspace Working Area

1. On the Title bar of the Workspace Editor, click **Add**.

   The Graphics Browser panel slides-in.

2. Click a graphic to create a card on the Workspace Editor working area.

### To replace the Industrial Graphic within a card

1. Select a card, and click Graphic icon.

   The Graphics Browser panel slides-in.

2. Select a graphic in the Graphics Browser to replace the graphic on the selected card.

   The existing content gets updated with the new one.

**Note:** If you are unable to find a created graphic, you can Search or click the Refresh icon and try again.

## Rename Cards

Each card has a default name based on the graphic item selected. You can rename the cards with a clearly identifiable function. The name of the card appears as the title on the card's title bar.

### To rename a card

1. Select the card to be renamed.
2. Click the Custom Setting icon.
3. In the **Custom Settings** panel, under the **Card Properties** section, enter a **Title** of your choice. .

## Adjust Card Size

You can adjust the size of the cards as per the requirement. The alignment guidelines and grids help in proper alignment of the cards.

### To adjust the card size

1. Point the cursor to the right bottom corner of the card to form an arrow.
2. Drag the card border to adjust the card size as required.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

## Modify Card Properties

Use the Content settings panel to modify the card properties. While some card properties are common across all cards, the graphic content properties vary based on the graphic item selected.

**Card Properties**

The card properties enable you to modify the properties of the cards on the working area.

- **Title**: Each card has a default name based on the graphic item selected. You can rename the cards with a clearly identifiable function. The name of the card appears as the title on the card's title bar.
- **Show Title**: Allows you to show or hide title of the card at runtime. Select the checkbox to display the title on the title bar of the card. By default, the **Show Title** checkbox is selected.

  If you do not want to show title in the development or at runtime, clear the selection on the **Show Title** checkbox. The title of the card will not be seen. However during development, you can hover over the card to view the title.

**Content Properties**

The content properties enable you to modify the properties of the selected graphics within the card.

- **Graphic Name**: Displays the name of the selected graphic. This is a read-only field and cannot be edited.
- **Custom Properties**: These properties are very specific to the graphic selected.

## Delete Cards

You can delete a card when you no longer need.

**To delete a card**

1. Select the card to be deleted.
2. On the card title bar, click **Delete**.

   The card is deleted.

## Bind Industrial Graphics Custom Properties

You can bind the workspace elements to InTouch tags This allows you to view the workspace in runtime live date from InTouch tags.

**To bind the Workspace to InTouch tags**

1. On the working area, highlight the card and click **Settings**.

   The **Content Settings** panel slides in.
2. In the Content Properties section, select the tags available for the selected graphic. You can also use constant value.
3. Close the Content Settings panel and click **Save**.

   The graphic will now have references from the selected attributes and tags.

**To search InTouch tags and Application Server attributes**

The tags and attributes are visible across applications.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.

That is, if Web Client is run for a standalone application, only InTouch tags for that application will be available. If Web Client is run for a managed InTouch application, InTouch tags and Application Server attributes will be available. If Web Client is run for an OMI application, Application Server attributes will be available.

1. When you search for an InTouch tag or an application server attribute, the ellipses button will be displayed if there is an application server attribute property or InTouch tag dot field which has the same data type as the data type of the custom property.
2. Click the ellipses button in the Custom Graphics field to search for InTouch tags and Application Server attributes.

   Only the attribute properties whose data type matches with the custom property will be displayed. If there are no attribute that match the selected graphic, the ellipses will not be displayed.

   **Note:** The characters '$' and '-' cannot be used for search. To display relevant tags containing these characters, enter the tag name without ‘$’ or ‘-‘.

In this initial release of Workspace, searching for Application Server attributes is not supported when using Workspace on a remote node. Searching for Application Server attributes is only supported on the GR or Galaxy Repository node. This feature will be supported in future releases.

© 2015-2023 AVEVA Group Limited or its subsidiaries. All rights reserved.